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Ecological Impact Assessment

Land at Woodgate Nurseries

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Report Summary

1. Hanbury Properties instructed The Ecology Co-op to undertake an Ecological Impact Assessment of a proposed development on land at Woodgate Nurseries. Following a Preliminary Ecological Appraisal and Phase 1 Habitat survey of the site by The Ecology Co-op on the 12th August 2020, a suite of Phase 2 ecological surveys was undertaken across 2021, 2022, 2023 and 2024 in order to provide sufficient baseline information for this assessment.
2. This document presents the findings of the surveys carried out across 2021, 2022, 2023 and 2024, and a full Ecological Impact Assessment in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines to inform an outline planning application for a residential development that will include up to 140 residential units.
3. The site totals approximately 8.1 hectares in area and includes sparsely vegetated land, bramble scrub, modified grassland, individual trees, hedgerows, developed land, buildings and running water (consisting of a drainage ditch). It is bordered by farmland and a former plant nursery business.
4. Protected species identified during Phase 2 surveys at this site include badgers, foraging and commuting bats, dormice, reptiles, breeding bird species and overwintering bird species.
5. Surveys for great crested newts did not identify any evidence that these species are found in this locality. As a result, no further surveys or mitigation measures are recommended with respect to these species.
6. A separate detailed mitigation statement and Habitat Creation and Management Plan is recommended to detail how badgers, bats, dormice, reptiles, breeding birds and overwintering birds will be protected throughout the development and where possible, net benefits be provided to the conservation of these species through outline proposals provided within this report. A EPS licence for dormice will be required will be required for the development.



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1 INTRODUCTION

1.1 Background

The site is located to the west of Lidsey Road, Woodgate, West Sussex PO20 3ST. The central grid reference for the site is SU 9352 0420.

Figure 1 shows the approximate boundary of the site and local context. The site area measures approximately 8.1ha.

The site comprises sparsely vegetated land, bramble scrub, modified grassland, individual trees, hedgerows, developed land, buildings and running water (consisting of a drainage ditch). It is bordered by farmland and a former plant nursery business.

The proposed development comprises a residential scheme to include up to 140 dwellings with associated parking, as well as soft and hard landscaping across the site. The Illustrative Block Plan for the proposed development is shown in Figure 2 below.

The Ecology Co-op undertook a Preliminary Ecological Appraisal (PEA)¹ of the site on the 12th of August 2020. Based on the findings of this assessment, presence/likely absence surveys for badgers *Meles meles*, common dormice *Muscardinus avellanarius*, great crested newts *Triturus cristatus*, common reptiles, breeding and overwintering birds, and emergence and activity surveys for bats have been undertaken.

1.2 Purpose of this Report

The purpose of this report is to:

- present the findings of surveys (baseline ecological information);
- identify and evaluate the most ecologically important features present on the site and within the zone of influence of the proposed development;
- describe the impacts of the proposed development and determine the significance of effects on these ecologically important features;
- set out the proposed impact avoidance, mitigation, compensation measures that will be undertaken to reduce these effects to an acceptable level;
- finally, detail the habitat creation and enhancement measures that will be put into place during the development. These are designed to ensure that it contributes to both local and national biodiversity objectives.

¹ The Ecology Co-op (2020) *Phase 1 Habitat Survey and Preliminary Ecological Appraisal – Land at former Woodgate Nurseries, Chichester*.



A biodiversity impact calculation has been prepared alongside this report, based on the most up-to-date existing habitat survey information and the most current outline plans for the proposed residential development upon the site.

This report is intended for submission as part of the planning application for the development.

The surveys and report were carried out and produced at the request of Hanbury Properties, supervised by Paul Whitby, BSc, full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and Chartered Ecologist (CEcol).

1.3 Policy and Legislation

Legal protection applying to relevant bird, mammal, herpetofauna and invertebrate species and current nature conservation planning policy is outlined in Appendix 1 of this report.

This report provides information on how the development proposal will be designed to meet the requirements of both the National Planning Policy Framework (NPPF) and local planning policy. Details of the NPPF and relevant local planning policy is provided in Appendix 1.



Figure 1. An aerial image showing the location of the site. The approximate site boundary is outlined in red. Images produced courtesy of Google maps (map data ©2024 Google).

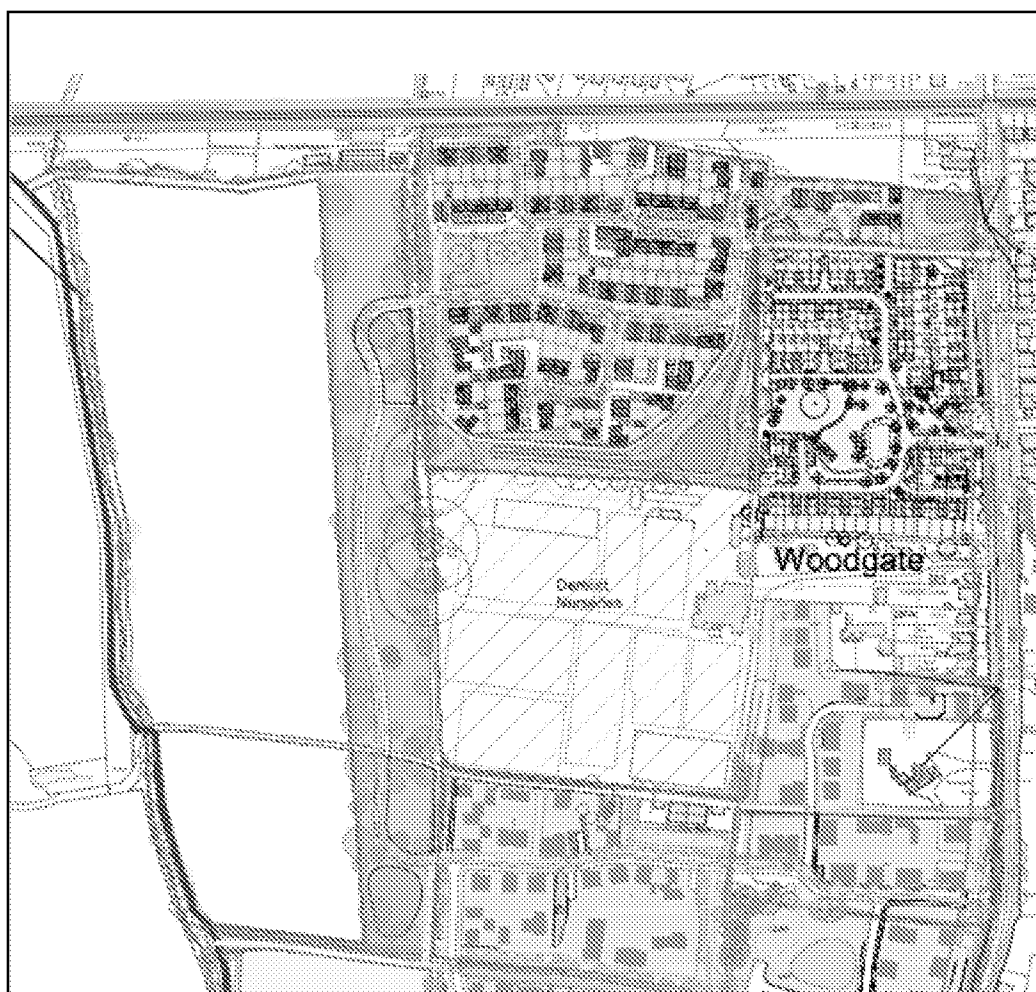


Figure 2. Illustrative Block Plan with a red line indicating the site boundary, courtesy of Davies Landscape Architects (Woodgate Block Plan, No. L01, Rev S07).



2 SURVEY METHODOLOGY

The following sections describe the methods used in the desk study and protected species/habitat survey(s). All survey methods are in accordance with current best practice guidance for the respective species/taxonomic group and any limitations encountered during the survey are explained in section 2.11.

This document is written in accordance with the CIEEM Guidelines for Ecological Impact Assessment² and CIEEM Guidelines for Ecological Report Writing³ Details of the ecological assessment methods are provided within section 2.10 below.

2.1 Badgers

Badgers tend to live in family groups with clearly defined territories with the main sett, used throughout the year, as a focal point. The territory often also contains a number of 'annex', 'subsidiary' and outlier setts that are used intermittently. Badgers can exist in a variety of habitats, but a mixed farmland landscape containing pasture and arable land, studded with woodland, scrub and hedgerows support the highest population density.

In 2021 a comprehensive walkover survey of the site was undertaken on 26th May and 24th August, covering all field parcels and boundary features. Special attention was paid to boundary features such as hedgerows and earth banks where signs of badger activity is often concentrated. Surveyors searched for badger setts, latrines, foraging marks, footprints and worn pathways, and trapped hairs on fences and any other evidence of badger activity. Repeat surveys were undertaken in June 2022, May 2023 and June 2024.

2.2 Bats

There are 18 species of bat resident in the UK, each with their own specific habitat requirements. Bats can use a wide range of features for roosting purposes including loft spaces, cavity walls, loose tiles, mortice joints and cracks/gaps in a variety of built structures. They can also be found in trees with holes, splits, cracks, cavities, ivy and loose bark. Bats are generally active at night and utilise a wide range of habitats for foraging and commuting between roost sites, hibernation sites and foraging habitats. Linear features such as hedgerows, woodland edges, even fences can be important for navigation between roosting and foraging habitats.

2.2.1 Bat Scoping Assessment

A detailed building inspection was led by Kelly Brown, GradCIEEM, on the 12th of August 2020 and

² CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

³ CIEEM (2017) *Guidelines for Ecological Report Writing, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester.



Lynn Spencer, BSc (Hons), MSc, ACIEEM, on 18th July 2022, looking for potential access points and potential roosting features (PRFs) that bats could use and any evidence indicating the presence of bats using the building, such as rub marks, staining or droppings. This included a ground-based external inspection around the buildings and internal inspection of any loft spaces or roof voids, where safe access was possible. A high-powered torch were used to fully investigate any suitable features.

The potential for roosting bats for each feature, or group of features was assessed as either negligible, low, moderate, or high, in accordance with the Bat Conservation Trust Survey Guidelines (Collins, J.(ed.) (2016)⁴. Any evidence confirming the presence of bats was clearly recorded, including photos and samples (e.g. droppings) where appropriate. Further surveys have been recommended where necessary.

All trees likely to be affected directly or indirectly by the proposed development were subject to a ground-based visual inspection to identify potential roost features, followed by climbing inspections where necessary and safe, to look for evidence of roosting bats and to further assess the suitability of the feature.

Each tree was inspected from the ground using binoculars for features which could potentially support roosting habitat for bats. Features of interest include woodpecker holes, loose bark, cracks and splits in limbs, natural holes and hollows and cavities were noted. Each tree/feature was categorised for its potential to support roosting bats as shown in Table 1 in accordance with best practice guidance.

This was followed up with tree climbing surveys led by Owen Crawshaw, BSc (Hons), MCIEEM, on the 3rd May 2022 and 22nd July 2024, using an endoscope and high-powered torch to fully investigate any suitable features.

Table 1. Characterising potential roost features in trees.

Category	Description
Negligible	A tree with negligible roosting habitat features likely to be used by bats.
Low	A tree of sufficient size to potentially support roosting features, but with none seen from the ground or features identified of limited roosting potential.
Medium	A tree with one or more potential roost sites that could be used by bats due to their size, conditions, and surrounding habitat, but unlikely to support a roost of high conservation status such as a maternity or hibernation roost.
High	Trees with one or more potential roost sites that appear suitable for large numbers of bats or use as maternity or hibernation roosts.

2.2.2 Bat Activity Surveys – Walked Transects

Bat activity surveys followed best practice guidelines⁴ in 2021 and updated best practice guidelines⁵ in 2024. Seven activity surveys were completed in 2021 and three activity surveys were completed in

⁴ Collins, J.(ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

⁵ Collins, J.(ed.) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.



2024. A pre-determined transect route was followed (Figure 3), focusing on all linear features within the site boundary (tree-lines and hedgerows). The transect route was walked at a slow pace during the period from sunset to two hours after sunset by a team of surveyors, such that each part of the route was passed approximately every twenty minutes. All surveys were undertaken during weather conditions suitable for bat activity and at ambient temperatures above 10°C. The surveyors recorded bat activity using 'Echo Meter Touch' bat detectors featuring auto-identification of bat species and automatically triggered recording for later review. The locations of all bat 'registrations' was recorded onto a field map during the survey to correspond with all sound recordings.

These were led by Natural England Level 1 class bat licence holder, Lynn Spencer.



Figure 3. Map of route walked (shown as yellow dashed line) during bat activity surveys. Images produced courtesy of Google maps (map data ©2024 Google).

2.2.3 Bat Activity Surveys – Automated Static Bat Detecting

One Elekon Batlogger C static bat detector was deployed on the site (Figure 4) monthly on six separate occasions, from May to October 2021 and one Song Meter Mini static bat detector was deployed on the site monthly on six separate occasions from April to September 2024. The detector was positioned to maximise likely detection of foraging and commuting bats based on habitat value.



The static detector was left in the field for a minimum of five days – the expected maximum lifetime of the battery. Static bat detectors comprise a passive recording device with real-time full-spectrum calls that can be viewed in detail once downloaded on analysis software, allowing accurate identification of most bat calls to species level (or genus level in the case of *Myotis* and *Plecotus* spp.).



Figure 4. Location of static bat logger (red dot) deployed in 2021 and 2024. Images produced courtesy of Google maps (map data ©2024 Google).

The 2024 data was processed using the British Trust for Ornithology's (BTO) Acoustic Pipeline v5.502⁵, an auto-identification system. The Acoustic Pipeline uses classifiers to detect and identify bat calls within files and assign them a probability or confidence percentage of the call belonging to a particular species. The data output from the pipeline was then processed differently depending on the species identified, but groups of species' calls underwent some degree of post-classification manual analysis by a suitably experienced bat acoustic analyst using Kaleidoscope Lite software v5.6.3⁶. Data management was facilitated using the R Shiny App through R Studio v2023.09.1+494⁷, which assisted

⁵ BTO (2023). BTO Acoustic Pipeline. Available from: <https://www.bto.org/our-science/products-and-technologies/bto-acoustic-pipeline>

⁶ Wildlife Acoustics (2023) Kaleidoscope Lite Analysis Software. Available from: <https://www.wildlifeacoustics.com/account/downloads/kaleidoscope>

⁷ RStudio Team (2020). RStudio: Integrated Development for R. Available from: <http://www.rstudio.com>



with creating random samples of some datasets to establish error rates.

Common and Soprano Pipistrelles

All calls with a confidence score of below 50% were discarded from the dataset. 10% of remaining calls from each detector then underwent post-classification validation through manual analysis to establish false positive error rates within the dataset. Each static detector was validated as bat calls can vary between habitats, meaning that the location in which the bat static detector is placed can influence the effectiveness of species detection. For the purpose of reporting, some results were adjusted in light of the error rate found to create a more representative number of calls, accounting for positive error rates. The data that has undergone this modification are clearly labelled as such.

Barbastelle

All 'low confidence' calls (i.e. calls with a confidence score of below 50%) were discarded from the dataset. All remaining calls were manually analysed due to the small call sample size for this species. All calls found to be incorrectly identified as barbastelle during verification were then also discarded from the dataset. The false positive error rate for this species was 1% for the central hedgerow static detector and 0% for the northern hedgerow static detector.

Myotis, Plecotus and Nyctalus species and Serotine

All calls from *Myotis*, *Plecotus*, *Nyctalus* and *Eptesicus* species were analysed, regardless of their confidence score. This is because calls from these genera overlap and are often very difficult to distinguish. Therefore, it is likely that the Acoustic Pipeline may otherwise underestimate the numbers of calls from these genera as it assigns them a lower confidence score, whilst the confidence in correctly analysing the genera the call belongs to is still high.

Noise Files

10% of all noise files identified by BTO Acoustic Pipeline were manually analysed to establish a false negative error rate. Individual error rates were established for each static detector deployment location (over the three seasonal deployments) due to possible variation in noise production from static detector placement.

The walked transect and static bat detector ('bat logger') survey methods complement each other with the transect surveys providing information on foraging and commuting patterns, and distribution across the site, and automated static detector surveys giving more prolonged coverage through consecutive nights, thus increasing the likelihood of detecting scarce species.

2.3 Breeding Birds

The method used for the breeding bird survey was adapted from the Breeding Bird Survey (BBS) methodology, designed by the British Trust for Ornithology (BTO)⁸ as an accessible means of monitoring British bird population trends over the UK using volunteers and frequently adapted for EclA.

⁸ <https://www.bto.org/about-birds/birdtrends/2018/methods/breeding-bird-survey>



The original methodology requires two visits per season to be carried out over many seasons, allowing data sets to be built up. The number of visits was increased to three in 2021 and further top-up surveys were undertaken in 2022, 2023 and 2024 to provide a more representative 'snapshot' of the bird assemblages present at the site during the survey season. Survey visits were completed on the 22nd April, 11th May and the 16th June 2021, the 17th June 2022, the 10th May 2023 and the 10th May, 30th May and 17th June 2024.

A pre-determined transect focusing upon all the fields and trees upon the site, inclusive of boundary hedgerows and margins fringing the site, was walked slowly on each visit. During this the observer recorded all birds encountered. As recommended in the BTO guidelines, all bird survey visits were carried out between 6am and 11am and were only undertaken during favourable weather conditions for bird activity, with periods of persistent or heavy rain, high winds or fog avoided. The transect route was walked at a constant slow pace by a competent bird observer, recording all birds detected either by sight or calls/song. The transect route was split into numbered sections and birds were counted within each of these sections. Notes regarding the behaviour of birds identified were made, to determine their breeding status. Birds were said to be 'confirmed as breeding' if they were observed carrying nesting material, food, or faecal pellets; or nests, eggs, or recently fledged young were discovered. Birds were recorded as 'likely breeding' if observed singing or displaying, repeatedly visiting the same locations and showing agitated or distraction behaviour. Each bird 'registration' was recorded on a field map of the survey site using standard BTO Common Birds Census (CBC) notation, which includes behaviours and flight movements.

After the surveys were completed, the total number of territories were estimated by comparing the locations of birds recorded on each of the survey visits. The total number of territories is based on the maximum number of territories recorded on any one visit plus any territories recorded on another visit in a different area of the site. This is then produced as a map.

In the UK, the conservation status of birds is recorded by the Royal Society for the Protection of Birds (RSPB) under a traffic-light system, with birds that regularly occur in the UK recorded as 'green', birds with an unfavourable conservation status recorded as 'amber' and birds that are globally threatened or showing severe decline in the UK as 'red'. The details for this classification can be seen on the RSPB website at:

http://www.rspb.org.uk/birds-and-wildlife/bird-and-wildlife-guides/bird-guide/status_explained.aspx

2.4 Overwintering Birds

A total of four surveys were undertaken between November 2020 and February 2021 and a further two in November 2022 and January 2023 for the purpose of identifying any overwintering bird species using the site. Survey methods followed those detailed in the Royal Society for the Protection of Birds' (RSPB) Bird Monitoring Methods (*Gilbert et al., 2002*)

The surveys visits were completed on the 20th November 2020, 21st December 2020, 21st January 2021, 25th February 2021, 30th November 2022 and 13th January 2023.

A pre-determined transect was walked slowly on each visit, paying particular attention to field centres



and linear features such as hedgerows and treelines. During this the observer recorded all birds encountered.

Each bird 'registration' was recorded on a field map of the survey site using standard BTO Common Birds Census (CBC) notation, which includes behaviours and flight movements.

2.5 Common Dormouse

Common dormice are typically associated with broadleaved woodland habitat, hedgerows, and scrub. They tend to occur at low density and good habitat connectivity is important. Common dormice need a constant supply of food throughout the active season over a large home range. A diversity of tree and shrub species will provide a range of fruit, nuts and insects. They hibernate during the winter typically at ground level amongst leaf litter and mosses protected by coppice stools, tree stumps or piles of brash wood.

2.5.1 Nest Tube/Box Survey

Dormouse surveys are undertaken by attaching purpose built 'nest tubes' on trees and shrubs in suitable habitat such as woodland, scrub and hedgerows. Nest tubes are used by dormice as places of shelter and they will often construct their nests within them during their periods of activity (typically between April and November). In accordance with current best practice guidelines⁹, 50 nest tubes were deployed within the site boundaries approximately 20m apart in hedgerows on 21st April 2021 & 23rd April 2024 and left *in situ* for the survey season (see Figure 5). Checks of the installed tubes commenced 1 month after the nest-tubes were positioned and checked on a monthly basis for presence of animals and evidence of dormouse presence (distinctively woven nests) from 28th May to 22nd September 2021 and 23rd May to 26th September 2024. Since the likelihood of use by dormice varies through the year, an index of probability score is used to determine confidence in a particular survey (see Table 2 below) comprising checks over several months. A minimum score of 20 is normally accepted to establish 'likely absence' in the event that no signs of dormice are found during the survey.

Table 2. Search effort score for each month that dormouse tubes are out on the site and subject to checks for occupation.

Month of check	Index of probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

Dormice checks were undertaken in the mornings and commenced one month after the nest-tubes were positioned. Surveys were undertaken under the supervision of licensed surveyors.

⁹ Bright, B., Morris, P., Mitchell-Jones, A.J. and Mitchell-Jones, T (1997) *The Dormouse Conservation Handbook*. English Nature.



Figure 5 . Dormouse nest tube locations (identified as red dots) across suitable habitat within the site and in nearby hedges connecting to the site. Images produced courtesy of Google maps (map data ©2024 Google).

2.6 Great Crested Newts

Great crested newts require ponds for breeding that meet a series of habitat criteria including good quality water, aquatic plants, and an absence of predatory fish. The ponds must have good connectivity to semi-natural terrestrial habitats that provide their invertebrate food sources and suitable safe places to rest and hibernate outside the breeding season. Great crested newts tend to occur more frequently in areas of high pond density across the landscape in 'metapopulations' where habitat occupancy ebbs and flows according to changes in conditions.

A visit was made by Lynn Spencer, GCN class licence holder & Associate CIEEM member, on the 29th April 2021 and 7th June 2024 to undertake an environmental DNA (eDNA) assessment of three ditches.

2.7 Reptiles

The common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus* are widespread species that can be found in many semi-natural habitats, such as rough grassland, scrub, heathland, and open woodland where there is good vegetation cover, an abundance



of invertebrate, amphibian or small mammal prey and areas of open ground for basking.

Standard reptile presence/likely absence surveys involve setting out artificial refugia (reptile 'mats' or 'tins') in potentially suitable habitat. Reptile mats are pieces of roofing bitumen felt and reptile tins are pieces of corrugated metal sheet approximately 0.5 sqm in size, which absorb heat from the sun more rapidly than the surrounding vegetation and provide cover and basking places attractive to reptiles. These are then checked for presence of animals under suitable weather conditions. They are placed in areas of potentially suitable habitat at an approximate density of 10 per ha, or 20 m apart along linear features in suitable habitat. There are no up-to-date best practice guidelines for reptile surveys, but a minimum of seven survey visits under suitable weather conditions is generally considered to be adequate when determining their presence/likely absence, and 15–20 visits are used to calculate a 'peak count' for population size class assessment.

Presence/absence surveys were completed in 2021 & 2024. During this a total of 32 roofing felt mats were used in this survey (see Figures 6&7). The mats were left *in situ* for a minimum of one week to 'bed in' and allow reptiles to locate them before the first check. The mats were checked at least seven times over the period 19th May to 14th July 2021 and 1st July to 19th August 2024, all observations of reptiles were recorded, together with the weather conditions, temperature, and time of day.



Figure 6. The location of reptile refuges in 2021 (identified with red dots). Images produced courtesy of Google maps (map data ©2024 Google).



Figure 7. The location of reptile refuges in 2024 (identified with red dots). Images produced courtesy of Google maps (map data ©2024 Google).

2.8 Other Notable Species

The site's habitats were broadly assessed for their potential to support species of principal importance for nature conservation (Section 41 NERC Act 2006) and other notable species. This includes mammals such as harvest mouse *Micromys minutus*, hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, and many bird species. The site was broadly assessed for its potential to support important invertebrate assemblages with specific attention paid to features such as standing dead-wood, wet flushes, bare earth banks and botanically rich areas.

2.9 Invasive Non-native Species

No specific surveys for invasive non-native species (INNS) were undertaken. However, the presence of any invasive non-native species encountered during other fieldwork, was recorded.



2.10 Impact Assessment Methodology and Mitigation

The assessment of ecological impacts and mitigation recommendations in this report follow CIEEM Guidelines for Ecological Impact Assessment (EclA)². This involves evaluating the importance of an 'ecological feature' (habitat, vegetation community, population of a single species or assemblages of species) in terms of nature conservation priority, followed by the application of the 'mitigation hierarchy'.

2.10.1 Importance of Ecological Features

A level of importance was assigned to all existing ecological features, through consideration of the rarity and distribution of a habitat or species, the population size, ecological function, and trends (declining/expanding), together with any designations, legal status, or conservation policies. CIEEM recommend that the importance of an ecological feature, in terms of nature conservation priority, should be considered within a defined geographical context (for definitions used by The Ecology Co-op, see Appendix 2):

- International and European
- National
- Regional
- County
- Local or parish
- Site/negligible.

Where protected species are present and there is the potential for a breach of the legislation as a result of the development proposals, those species are considered as 'important' features and included in the EclA. However, the level of importance assigned to the affected population of a protected species will vary depending on contextual information about the population size, distribution, abundance and trends across the range of geographical scales.

Similarly, irreplaceable habitats such as ancient broadleaved woodland are considered as 'important' features and included in the EclA. The level of importance will vary depending on the size of the habitat parcel, its distribution and abundance at different geographical scales.

Features that are considered to be important at site level only, or are of negligible importance, (such as paved ground or amenity grassland) are excluded from this EclA and it should be reasonable to assume that if a feature is not mentioned, it is not ecologically important.

2.10.2 Significance of Effects

In accordance with the EclA guidelines (CIEEM 2018)², a significant effect is defined as "an effect that either supports or undermines biodiversity conservation objectives for important ecological features". Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). The effects may be described as significant at a range of geographic scales as defined above.

The impacts are identified and described in relation to the following characteristics:



- *Adverse or positive* – does the impact result in the loss or gain in biodiversity/quality of the environment?
- *Extent, magnitude* – the spatial area over which the impact may occur, the area of habitat lost, or the number of individuals/populations affected.
- *Timing* – in relation to the life cycle of the ecological feature (e.g. nesting bird season)
- *Duration, frequency* – is the impact temporary or permanent, frequently repeated or a one-off event?
- *Reversibility* – is the impact temporary or permanent? Would the ecological feature recover after the impact?
- *Cumulative impacts* – in combination with other plans/projects

This report has only sought to describe in detail the impacts that are likely to be significant. Impacts that are either unlikely to occur, or if they did occur are unlikely to have a significant effect have been discounted or 'scoped out' at an earlier stage. Effects on the conservation status of ecological features are only assessed in detail if they have a high enough value (local or above) and impacts upon them may be a material consideration in decision-making in terms of legislation and planning policy. Impacts on features below local value are categorised as of neutral significance and are not considered further. However, where it has not been possible to robustly conclude that there are no significant effects (due to insufficient survey data or scientific research for example), then the precautionary principle will be applied, and a significant effect is assumed.

2.10.3 The 'Mitigation Hierarchy'

The assessment of the significance of an impact is made initially in the absence of mitigation. This is followed by a sequential process of determining the most appropriate way to remove or minimise significant impacts and effects. The preferred option is to avoid impacts in the first place, for example by redesigning the scheme to retain an important area of habitat, or timing works sensitively. Mitigation measures such as translocation or displacement of populations is only applied as a last resort where significant impacts and effects are unavoidable.

When residual significant adverse impacts and effects remain after all practicable measures to avoid and/or minimise these have been applied, compensation measures are required. Compensation measures include habitat creation in alternative locations that offset unavoidable habitat loss.

Finally, enhancements are proposed that do not relate to a specific impact and effect but provide net gains in biodiversity – taking advantage of opportunities in the design and operation of the development. These measures are intended to ensure that the proposed development contribute towards national and local biodiversity objectives.

2.11 Constraints/Limitations to Surveys

Surveys record any flora or fauna that is present at the time of the survey visits. It is therefore possible that some species may not have been present during the survey but may be evident at other times of the year and may appear or disappear from the site if habitat conditions change. For this reason, the



surveys are considered valid for up to eighteen months for badgers and bats, two years for reptiles and three years for great crested newts and dormice. If the habitat conditions change significantly in the intervening period, then it is recommended that the surveys be updated.

3 ECOLOGICAL BASELINE

3.1 Designated Sites

A search on MAGIC shows there is one designated site, The Brooks Local Nature Reserve (LNR), approximately 1.6km south of the site boundary. The results of the search are presented below. No other statutory designated sites are situated within 2km of the site.

Chichester and Langstone Harbours Special Protection Area (SPA) lies 9.8km west of the site, Pagham Harbour SPA lies 7.8km south-west of the site and Singleton and Cocking Tunnels Special Area of Conservation (SAC) lies 12km north-west of the site. A Habitats Regulations Assessment may be required to determine any likely significant effects of the proposed residential development on these internationally designated sites.

Table 3. Designated sites

Site name	Designation	Features listed on citation	Proximity
The Brooks (Bersted Brooks)	LNR	Wide areas of meadow, narrow reedbeds and ditches, permanent and temporary ponds, and an extensive newly planted floodplain woodland. The Brooks floods every winter, making it a good place for wetland wildlife.	1.6 km south

There is one granted EPS licence for mitigation projects within 1km of the site boundary. The licence in question (reference: 2014-4435-EPS-MIT), which concerns the destruction of common pipistrelle *Pipistrellus pipistrellus* resting places, relates to a site located approximately 0.95km south. There are no EPS mitigation licences for any other protected species within 1km of the site.

3.2 Habitats

The site consists predominantly of sparsely vegetated land. Habitats contained within the site include sparsely vegetated land, bramble scrub, modified grassland, individual trees, hedgerows, developed land, buildings and running water (consisting of a drainage ditch). It is bordered by farmland, residential developments, and a former plant nursery business.

Table 4. below lists the UK Habitat Survey categories found at the site, with target notes on specific features of interest and the general species composition. Note that detailed information on buildings and waterbodies with respect to bats and great crested newts are presented in the following sections. The UK Hab habitat map for the site and key to the standard mapping symbols used is presented in Figure 8.



Table 4. The UK hab habitats contained within the site.

Habitat type	UK hab code	Approximate area (ha) length (m)	Target note including species composition	Ecological importance
Sparsely vegetated land	u1 (81)	3.324ha	Comprised a large area in the east of the site. Species present include groundsel species <i>Senecio sp.</i> , oxeye daisy <i>Leucanthemum vulgare</i> and greater plantain <i>Plantago major</i> .	Site
Modified grassland	g4	0.662ha	This habitat type comprised a strip of modified grassland in the north east of the site. The grassland is species-poor and mown, dominated by perennial rye-grass <i>Lolium perenne</i> with occasional cocks-foot <i>Dactylis glomerata</i> , ribwort plantain <i>Plantago lanceolata</i> and daisy <i>Bellis perennis</i> .	Site
Bramble scrub	h3d	1.028ha	Comprised patches of bramble scrub <i>Rubus fruticosus</i> in the eastern section of the site.	Site
Species-rich native hedgerow	h2a5	1.229m	An intact species-rich hedge along the north and west boundaries of the site. The hedge comprised hawthorn <i>Crataegus monogyna</i> , field maple <i>Acer campestre</i> , hazel <i>Corylus avellana</i> and ash <i>Fraxinus excelsior</i> .	County
Non-native hedgerow	h2b	33m	Comprised a species-poor hedge with trees along the eastern boundary.	County
Line of trees (non-native)	w2 (33)	65m	Comprised a line of trees along the north eastern boundary dominated by leylandii.	Negligible
Ditch	r1g (50)	115m	Runs along the road boundary in the east of the site.	Negligible
Individual trees	N/A	N/A	Comprise predominantly pedunculate oak <i>Quercus robur</i> scattered throughout the site.	Negligible
Developed land, sealed surface	u1b	0.346ha	Hardstanding road/driveways in eastern section of site.	Negligible
Buildings	u1b5	0.043ha	Seven dwellings of varying sizes in the eastern section of the site.	Negligible
Arable	c1	2.572ha	This comprised a strip of arable land along the west of the site. The field was ploughed at the time of survey.	Negligible

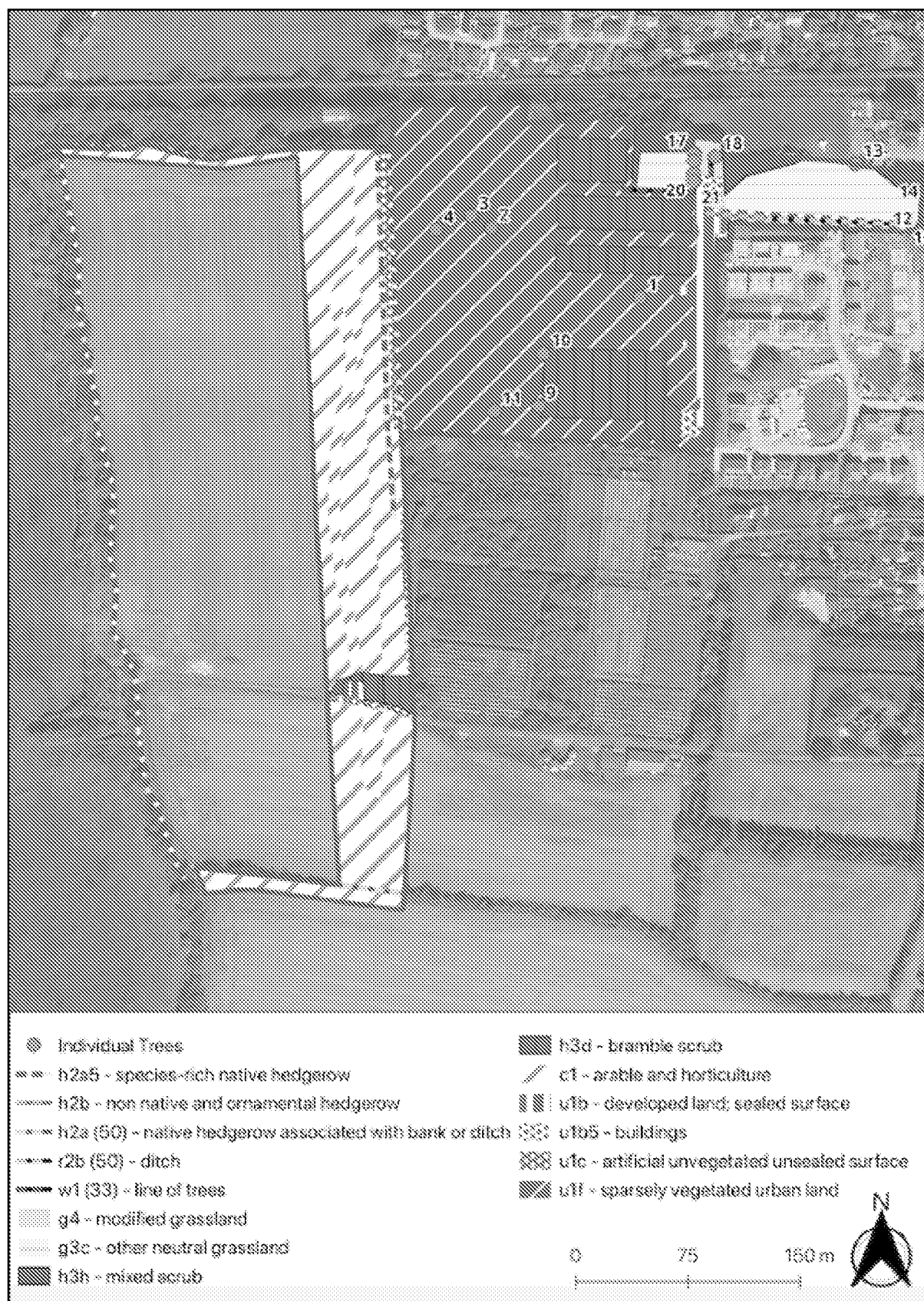


Figure 8. UK Hab habitat map of the site recording habitats present and a key to habitats.



3.3 Badgers

Information relating to badgers is provided in a confidential Appendix 6 which must not be released into the public domain.

3.4 Bats

3.4.1 Natural Roost Features – Trees

The trees within the hedgerows on site were found to have negligible potential for roosting bats.

Of the 107 trees subject to ground based assessment within the footprint of the proposed development, nine exhibited potential roosting features. These trees were then climbed and surveyed in detail using an endoscope, see Table 5.

Table 5. Potential roost features in trees

Tree no. and species	Ground level tree assessment findings	Assessment of potential suitability	Endoscope findings	Residual potential
Pedunculate oak T1	Hole on north aspect of stem, branch cavity on topside of north extending limb, wound on topside of east extending limb, large scar/snap on stem north aspect.	Moderate	Wound on topside of E extending limb @ 8m. Entrance 10cm. Extensive cavity extending 1m into stem. Narrows at top down to 2cm. Dry.	Moderate
Sessile oak T2	3 x wp holes on SE of extending limb at 5m.	Low	Not climbed. Inspected with binoculars from ground. Back of cavities visible.	Low
Pedunculate oak T3	Branch cavity @ 5.5m NW aspect on branch.	Moderate	Entrance 8cm diam. Extends into branch 40cm deep, 6cm width. Relatively large and exposed.	Low
Pedunculate oak T4	WP/squirrel hole @5m on W aspect of stem.	Low	Squirrel fur around entrance. Entrance 10cm diam. Domed roof cavity which extends down 30cm.	Negligible-Low
Pedunculate oak T5	4 x wp holes on E extending limb N aspect.	Moderate	Not climbed. Inspected with binoculars from ground. Back of cavities visible.	Low



Tree no. and species	Ground level tree assessment findings	Assessment of potential suitability	Endoscope findings	Residual potential
Pedunculate oak T6	Knot hole @4m on SW aspect of limb.	Low	Squirrel hole – 2 animals in hole. Entrance 10cm diam. Well worn – gnawed. Large internal cavity 30cm x 30cm. Smooth.	Negligible-Low
Pedunculate oak T7	Two dead limbs but no associated PRFs.	Low	No suitable features.	Negligible
Pedunculate oak T8	Knot hole @ 2m on E aspect of stem.	Moderate	Entrance 5cm diam. Extends back 7cm. Roof shallows – wedge shaped cavity.	Low
Crack willow T9	Large shearing crack on S of stem.	Low	Associated hole hollowed out by squirrels. Exposed at top and bottom. Splintering wood with no cavities.	Negligible

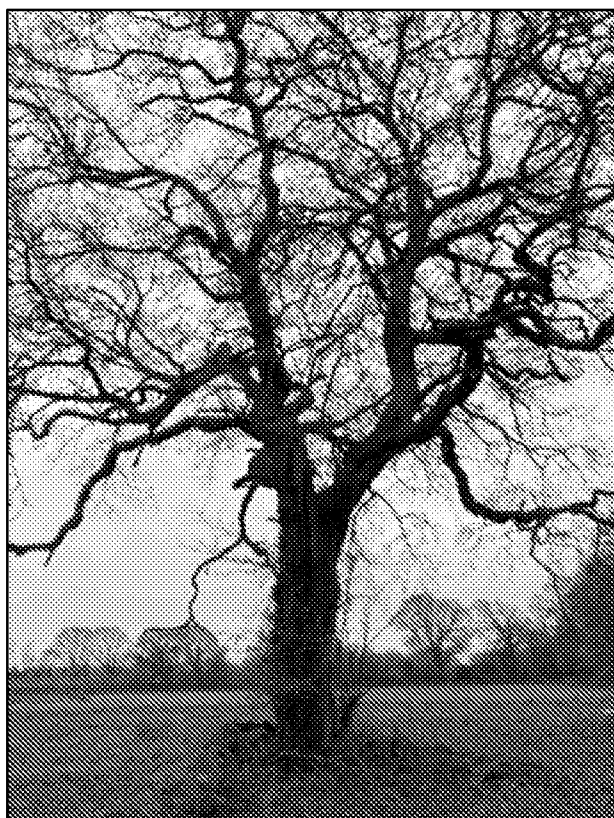


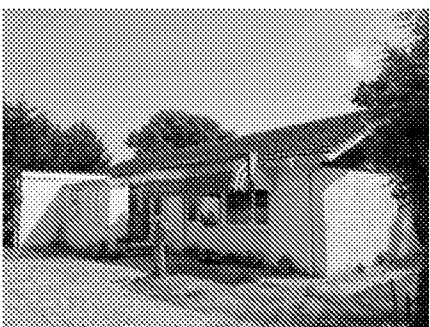
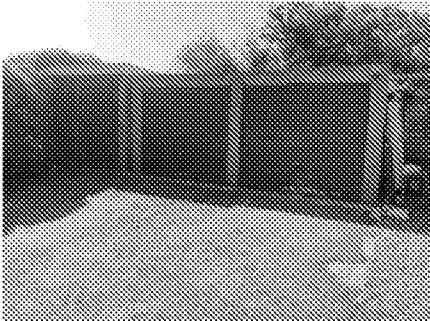
Figure 9. Photograph of T1 with moderate potential



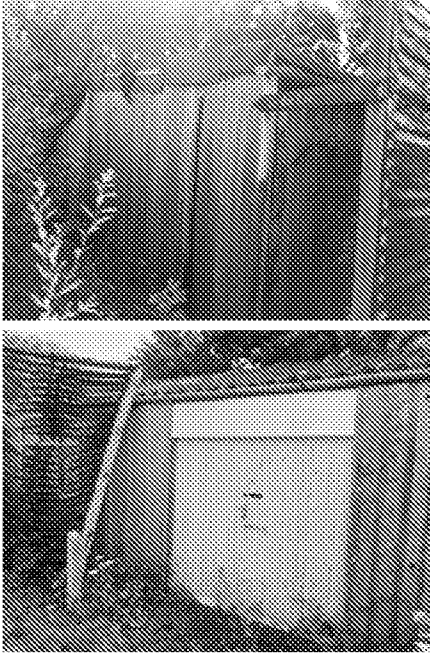
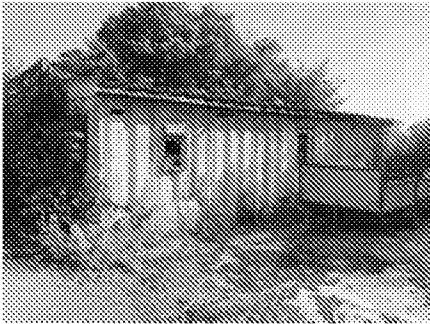
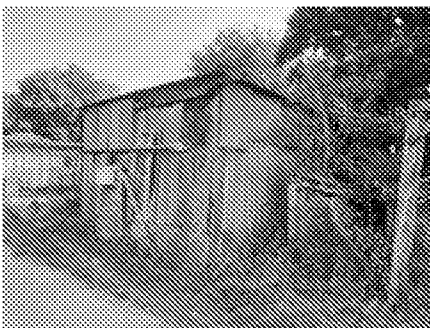
3.4.2 Built Structures – Scoping Assessment

Seven buildings were assessed for bat roosting potential – the results of which are presented in Table 6.

Table 6. Potential roost features for bats

Building number	Description of features	Assessment of potential suitability	Photographs
B1	Brick construction residential bungalow with pitched concrete tiled gable roof. All walls and roof in good repair, no cracks or gaps in walls, ridge tiles etc. A small area of shiplap weatherboarding is present on gable walls, but there are no visible gaps leading behind this. There is a small flat felt roof section on western side that is tight-fitting. Roof void contained wooden beams, bitumen lining and rock wool insulation. No cracks in the wooden beams or access points for bats. No evidence of bats.	Negligible	 
B2	A block of three concrete garages, all with corrugate chrysotile single pitch roofs. The eastern garage has a plastic fascia trim around the sides of the roof with a narrow gap between the fascia and the wall that could be accessed by bats, however cobwebbing is covers this gap indicating it is not used by bats. The double garage has a concrete trim.	Negligible	
B3	A timber structure with a bitumen roof lining. The lining appears to have been applied to a plywood base and there does not appear to be crevices of significant roosting value present. It is attached to a concrete and corrugated	Negligible	



Building number	Description of features	Assessment of potential suitability	Photographs
	chrysotile structure with timber double doors that also lacks suitable roosting features.		
B4	This is a simple building with corrugated chrysotile or similar composite material walls and roof. There are a few gaps at the top of the wall, however these gaps are likely to be unsuitable for roosting bats due to the thermal properties of the thin corrugated walls, which would have a very low thermal mass.	Negligible bat roost potential	
B5	This is corrugated chrysotile and metal clad building in poor condition set onto a simple timber frame. The overlap between corrugated sheets creates some crevices, but these are unsuitable for bat roosting.	Negligible	



Building number	Description of features	Assessment of potential suitability	Photographs
B6	Wooden panelled residential bungalow with hipped clay tiled roof. All walls and roof in good repair, no cracks or gaps in wooden panelling, ridge tiles, roof tiles or wooden soffits. There was no roof void.	Negligible	
B8	This is a simple storage shed with a corrugated metal single pitch roof and concrete and brick single skin walls. The internal aspects are open to the elements via an open access door and the maximum internal height is approximately 2.4m. The lack of a roof lining and wall cavity mean there are no crevices that might support bats and there was no evidence of void-dwelling bat species. The internal aspects are sub-optimal for bats given the exposure via the open door and low ceiling height.	Negligible	

3.4.3 Bat Emergence Surveys

One bat emergence survey was undertaken in 2022 of T1 to determine the importance of this tree to roosting bats. This tree was also climbed and surveyed using an endoscope in 2024.

The date, times, weather conditions, temperatures and personnel for the survey are presented in Table 7 below:

Table 7. Details of survey timings, weather conditions and personnel for T1

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions throughout survey	Surveyors
9 th August 2022 Emergence survey	Start time: 20:04 Sunset: 20:34 Finish time: 22:04	Max/min temp: 15–18°C 0% cloud cover, still, dry	Lynn Spencer Sophie Cardinal
22nd July 2024 Tree climb &	N/A	N/A	Owen Crawshaw Rozel Hopkins



inspection			
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No bats were identified emerging from the tree. Bat activity in the area was low with one common pipistrelle *Pipistrellus pipistrellus* and one soprano pipistrelle *Pipistrellus pygmaeus* foraging in the area during the evening.

The tree climbing inspection identified a small number of common pipistrelle droppings in a potential roost feature. No roosting bats were found.

3.4.4 Bat Activity Surveys – Walked Transects

A total of seven species were recorded across the site: common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctule*, serotine *Eptesicus serotinus*, myotis species *Myotis sp.*, long-eared bat *Plecotus sp.* and barbastelle *Barbastella barbastellus*. Activity was low during each survey and was concentrated along linear features such as hedgerows around the field boundaries. Recordings were predominantly of common and soprano pipistrelle, with few recordings of noctule, serotine, long-eared bat and myotis species and three recordings of barbastelle. Of these species, barbastelles are regarded as vulnerable in England. In addition, soprano pipistrelle, noctule and barbastelle are listed as UK Biodiversity Action Plan species².

Survey conditions and timings are presented in Table 8. The results of the walked transect surveys is summarised in Figure 10. This shows the distribution of all bat 'observations' on the walked transects, during which the route was covered at least twice in a session.



Table 8. Walked transect metadata: dates, times, temperature, weather conditions.

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions	Surveyors
21/04/21	Start time: 20:07 End time: 22:07 Sunset: 20:07	Max/min temp.: 11.0/7.5°C 10% cloud cover, wind 2, dry	James Whitby
26/05/21	Start time: 21:00 End time: 23:00 Sunset: 21:00	Max/min temp.: 13.5/11.8°C 90% cloud cover, wind 0, dry	Lynn Spencer
30/06/21	Start time: 21:20 End time: 23:20 Sunset: 21:20	Max/min temp.: 17.4/13.8°C 95% cloud cover, wind 0, dry	Lynn Spencer
27/07/21	Start time: 20:55 End time: 22:55 Sunset: 20:55	Max/min temp.: 18.5/14.8°C 90% cloud cover, wind 2, dry	Lynn Spencer
24/08/21	Start time: 20:05 End time: 22:05 Sunset: 20:05	Max/min temp.: 18.0/14.8°C 10% cloud cover, wind 2, dry	Charlotte Hammond
14/09/21	Start time: 19:19 End time: 21:19 Sunset: 19:19	Max/min temp.: 20.0/18.0°C 80% cloud cover, wind 0, dry	Holly Waters
05/10/21	Start time: 18:31 End time: 20:31 Sunset: 18:31	Max/min temp.: 12.0/13.3°C 40% cloud cover, wind 2, dry	Lynn Spencer
20/05/24	Start time: 20:53 End time: 22:53 Sunset: 20:53	Max/min temp.: 13.9/12.9°C 50% cloud cover, wind 1, dry	Lynn Spencer
16/07/24	Start time: 21:08 End time: 23:08 Sunset: 21:08	Max/min temp.: 17.0/14.2°C 60% cloud cover, wind 2, dry	Lynn Spencer
17/09/24	Start time: 19:11 End time: 21:11 Sunset: 19:11	Max/min temp.: 16.0/16.0°C 10% cloud cover, wind 2, dry	Jenna Fairchild



Figure 10. Approximate distribution of bats detected during the transect surveys. Coloured dots represent bat activity. Purple = common pipistrelle, pink = soprano pipistrelle, blue = long-eared bat, yellow = serotine, orange = noctule, green = myotis and white = barbastelle. The size of the dot indicates the intensity of activity: small dot = a single pass of one bat; medium dot = multiple passes on two to three separate occasions; and large dot = activity recorded on four or more occasions at that location during the night. Images produced courtesy of Google maps (map data ©2024 Google).

3.4.5 Bat Activity Surveys – Automated Static Bat Detecting

Surveys to determine bat activity using an automated static bat detector and the analysis of data collected in 2024 are on-going. The findings will be presented on completion of the surveys and analysis. However, to date, the analysis indicates that there are no significant changes to species present on site and relative activity compared to data collected in 2021.

A total of eight species were recorded across the site: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle *Pipistrellus nathusii*, serotine, Leisler's bat *Nyctalus leisleri*, barbastelle, long-eared bat and *Myotis* spp. Of these species, Western barbastelle and serotines are regarded as vulnerable in England and Nathusius' pipistrelle and Leisler's bat are classed as near threatened



according to the IUCN Red List¹⁰. In addition, soprano pipistrelle are listed as UK Biodiversity Action Plan species². Bats from both the *Plecotus* and *Myotis* genera were recorded, but due to echolocation overlap it is impossible to accurately separate the individual species and therefore their importance within the context of their conservation status cannot be obtained.

The results and estimated activity levels for each month are summarised below, whilst detailed data regarding passes per night for each species per month can be found in Tables 9&10.

April

2024: During this month, low levels of activity were recorded for all species groups except for Nathusius' pipistrelle, serotine and Leisler's bat, which were not present. Common pipistrelle bats were most frequently recorded with 55 passes logged in total across the five nights. Soprano pipistrelle bats recorded 29 passes logged in total across the five nights. All other bat species present had less than ten passes recorded over the five-night period.

May

2021: During this month, low levels of activity were recorded for all species groups except for noctules and barbastelles, which were not present. Common pipistrelle bats were most frequently recorded with 23 passes logged in total across the five nights. All other bat species present had less than ten passes recorded over the five-night period.

2024: During this month, low levels of activity were recorded for all species groups except for common pipistrelle, which were present in higher numbers. Common pipistrelle bats were most frequently recorded with 1383 passes logged in total across the five nights. Soprano pipistrelles had 37 passes logged in total over the five nights. All other bat species present had less than ten passes recorded over the five-night period.

June

2021: Six bat species groups were recorded during this month, with Nathusius's' pipistrelle, Leisler's and western barbastelle not found to be present. Again, low levels of activity were recorded for all species present. The highest number of passes documented was for common pipistrelle, with 80 passes recorded. Soprano pipistrelle bat activity was higher than the previous month, with 16 passes logged. All other bat species groups again had less than ten calls documented.

2024: Eight bat species groups were recorded during this month, with Leisler's bat not found to be present. The highest number of passes documented was for common pipistrelle, with 1082 passes recorded. Soprano pipistrelle bat activity was higher than the previous month, with 255 passes logged and *Myotis* species had 180 passes logged in total over the five nights. All other bat species groups again had less than ten calls documented.

¹⁰ The Mammal Society, 2020. Red List for Britain's Mammals. Available at: <https://www.mammal.org.uk/science-research/red-list/>

² JNCC, 2007. List of UK BAP Priority Terrestrial Mammal Species (2007). Available at: <https://data.jncc.gov.uk/data/98fb6dab-13ae-470d-884b-7816afce42d4/UKBAP-priority-terrestrial-mammals.pdf>



July

2021: Pipistrelle bat activity was higher this month, July recorded the peak number of common pipistrelles for all months, with 119 passes detected. Soprano pipistrelle bat activity was higher than the previous month, with 36 passes logged. All other bat species groups again had less than ten calls documented. Long-eared bats and western barbastelle were not recorded this month.

2024: Pipistrelle bat activity was high this month, with 969 passes detected. Soprano pipistrelle bat activity was higher than the previous month, with 85 passes logged. Myotis activity was higher this month with 12 passes detected. Nathusius' pipistrelles were not recorded this month. All other bat species groups again had less than ten calls documented.

August

2021: Bat activity dropped compared to previous months. Nathusius' pipistrelles were also not recorded this month. 84 calls were logged for common pipistrelles and 25 for soprano pipistrelles. All other bat species groups again had less than ten calls documented. Nathusius's' pipistrelle, Long-eared bats and western barbastelle were not recorded this month.

2024: Bat activity dropped overall compared to previous months. Nathusius' pipistrelles were also not recorded this month. 237 calls were logged for common pipistrelles and 171 for soprano pipistrelles. Serotine activity was higher this month with 18 calls logged. All other bat species groups again had less than ten calls documented.

September

2021: Overall, bat activity again decreased compared to the prior month. 43 calls were logged for common pipistrelles and 12 for soprano pipistrelles. All other bat species groups again had less than ten calls documented. Nathusius's' pipistrelle and Leisler's bats were not recorded this month.

2024: Bat activity again decreased compared to the prior month. 8 calls were logged for common pipistrelles and 2 for soprano pipistrelles. All other bat species groups again had less than ten calls documented. Serotine, Leisler's bats and Barbastelle were not recorded this month.

October

2021: Bat activity was slightly increased this month. 98 calls were logged for common pipistrelles, 68 for soprano pipistrelles, 12 for Myotis species and 10 for western barbastelle. All other bat species groups again had less than ten calls documented. Noctule and Leisler's bats were not recorded this month.

Table 9. Mean number of passes recorded by the static logger (rounded to nearest whole number) per night. The static logger was placed out for 5 nights. CP = common pipistrelle, SP = soprano pipistrelle, NP = Nathusius' pipistrelle, LE = long-eared bat species, MYO = Myotis spp., SERO = serotine, NOC = noctule, LEI = Leisler's bat, BAR = barbastelle. '*' indicates species genus groups rather than individual species.

Date (2021)	CP	SP	NP	LE	MYO*	SERO	LEI	NOC	BAR	Total
May	23	9	<1	1	3	3	<1	-	-	41



June	80	16	-	3	5	<1	-	<1	-	106
July	119	36	<1	-	2	1	3	2	-	164
August	84	25	-	-	<1	<1	<1	2	-	114
September	43	12	-	1	1	<1	-	<1	<1	60
October	98	68	1	<1	12	<1	-	-	10	191
Total	447	166	3	6	24	8	5	6	11	

Table 10. Mean number of passes recorded by the static logger (rounded to nearest whole number) per night. The static logger was placed out for 5 nights. CP = common pipistrelle, SP = soprano pipistrelle, NP = Nathusius' pipistrelle, LE = long-eared bat species, MYO = Myotis spp., SERO = serotine, NOC = noctule, LEI = Leisler's bat, BAR = barbastelle. '**' indicates species genus groups rather than individual species. Common and soprano pipistrelle calls have had error rates established by manually analysing 10% of each species' calls across all six months of static detectors for each location.

Date (2024)	CP	SP	NP	LE	MYO*	SERO	LEI	NOC	BAR	Total
April	55 (±>1)	29	0	>1	5	0	0	1	>1	92
May	1383 (±>1)	37	3	0	9	>1	2	3	7	1445
June	1082 (±>1)	255 (±>1)	>1	0	180	>1	>1	2	8	1530
July	969	85	0	>1	12	>1	0	2	9	1418
August	237 (±>1)	171	0	4	10	18	>1	10	24	475
September	8 (±>1)	2	>1	>1	15	0	0	6	0	34
Total	3734	579	5	7	231	21	4	24	49	

For common and soprano pipistrelles, post-classification verification of the data auto-analysed by BTO Acoustic Pipeline was carried out. False positive error rates for common and soprano pipistrelles were low.

3.4.6 Pre-existing Records

SxBRC provided 175 bat records in the search area comprising 8 identified species. The number of records for each species is presented in Table 11.

Table 11. Number of pre-existing records of each bat species within 1 km of the site boundary.

Species Common name/Scientific name	Number of records
Common pipistrelle <i>Pipistrellus pipistrellus</i>	50
Soprano pipistrelle <i>Pipistrelle pygmaeus</i>	23
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	4
<i>Pipistrelle</i> species	10
Brown long-eared <i>Plecotus auritus</i>	7
Long-eared species <i>Plecotus</i> sp.	12
Serotine <i>Eptesicus serotinus</i>	18
Noctule <i>Nyctalus noctule</i>	17
Barbastelle <i>Barbastella barbastellus</i>	18
Whiskered bat <i>Myotis mystacinus</i>	2
<i>Myotis</i> species	12



Unidentified bat species	2
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3.4.7 Interpretation

The habitats contained within the site have limited value to foraging bats as there is a lack of semi-natural habitats to support a continuous supply of invertebrates. However, the hedgerows offer some foraging opportunities and linear features for commuting and are connected to other hedgerows and scattered trees in the wider landscape.

The activity surveys have demonstrated that the habitats contained within the development site do support foraging bats, but in relatively low numbers. Bats are opportunistic and will exploit a range of habitats across the landscape in response to the rise and fall of insect populations. These surveys indicate that the habitats contained on the site are utilised as part of the wider landscape by predominantly common and widespread bat species. Barbastelle were recorded on the site, however, there were few records of this species, with a maximum of eleven passes on one night, indicating the site is not frequently used by this species, which is known to be very wide ranging.

As such, the development site is not considered to be important to bats beyond the **local level**.

3.5 Breeding Birds

3.5.1 Survey Results

In total, 24 species of bird were recorded during the surveys; of these, 5 species are 'red' listed under the Birds of Conservation Concern (BoCC) and 4 are 'amber' listed. The following species recorded during the survey are also listed under Section 41 of the NERC Act (2006): dunnoek *Prunella modularis*, linnet *Carduelis cannabina* and yellowhammer *Emberiza citrinella*.

Table 12 presents the dates, times and survey conditions recorded for each visit.

Table 13 presents the bird survey results combined for all visits. The table is divided into red, amber, and green lists from the BoCC categories.

Table 12. Weather conditions recorded during breeding bird surveys.

Survey date	Survey time	Weather notes	Surveyor
22/04/21	06:20–08:39	7 degrees Celsius and 0–5mph wind, 0% cloud cover	Paul Whitby, BSc, MCIEEM, CEcol
11/05/21	06:10–08:20	8 degrees Celsius and 0–5mph wind, 80% cloud cover	Paul Whitby, BSc, MCIEEM, CEcol
16/06/21	07:05–09:10	15 degrees Celsius, 0% cloud cover and 0–5mph wind	Paul Whitby, BSc, MCIEEM, CEcol
17/06/22	05:06–06:37	14 degrees Celsius, 10% cloud cover and 0–5mph wind	Paul Whitby, BSc, MCIEEM, CEcol
10/05/23	19:00–20:45	18 degrees Celsius, 30% cloud cover and 0–5mph wind	Paul Stevens
06/05/24	05:45–06:58	11.5 degrees Celsius, 0% cloud cover	Libby Morris



		and 0–5mph wind	
30/05/24	05:40-07:40	11 degrees Celsius, 100% cloud cover and 0–5mph wind	Libby Morris
17/06/24	20:03-21:37	10 degrees Celsius, 30% cloud cover and 0–5mph wind	Libby Morris

Table 13. Breeding bird survey summary list.

RESULTS Species	Apr 22 nd 21	May 11 th 21	Jun 16 th 21	Jun 17 th 22	May 10 th 23	May 6 th 24	May 30 th 24	Jun 6 th 24
Greenfinch <i>Carduelis chloris</i>	5	2	5	7		3		1
House sparrow <i>Passer domesticus</i>	1	1	3	1	1			1
Linnet <i>Carduelis cannabina</i>	4	3	2			2	6	
Starling <i>Sturnus vulgaris</i>	3	2	1	23		7		
Yellowhammer <i>Emberiza citrinella</i>								
Dunnock <i>Prunella modularis</i>	23	1				1	1	
Rook <i>Corvus frugilegus</i>						2		2
Stock dove <i>Columba oenas</i>					1			
Wren <i>Troglodytes troglodytes</i>		1	3	3	1	3	1	1
Blackbird <i>Turdus merula</i>	4	6	2	4	2	4	4	
Blackcap <i>Sylvia atricapilla</i>					2	2	1	1
Blue tit <i>Cyanistes caeruleus</i>	1	4	4					
Corvid crow <i>Corvus corone</i>		1		4			1	
Chaffinch <i>Fringilla coelebs</i>			1	4	1	4	3	
Chiffchaff <i>Phylloscopus collybita</i>	4	1				3	1	2
Collared dove <i>Streptopelia decaocto</i>						1		
Common buzzard <i>Buteo buteo</i>					1			
Goldfinch <i>Carduelis carduelis</i>	4					4		
Great tit <i>Parus major</i>						3	1	1
Jay <i>Garrulus glandarius</i>					1			
Robin <i>Erithacus rubecula</i>	5	5		2	6	1	2	
Siskin <i>Carduelis spinus</i>						1	2	
Song thrush <i>Turdus philomelos</i>						2		2
Whitethroat <i>Sylvia communis</i>						1	2	

3.5.2 Pre-existing Records

SxBRC provided numerous bird records for the search area concerning a total of 176 species. Most of these species are relatively common and widespread, but the list includes 30 species of principal importance for conservation (S41 NERC Act 2007), and 37 species listed on Schedule 1 of the Wildlife and Countryside Act. In addition, 37 species are red listed on the Birds of Conservation Concern

A high proportion of the records are non-breeding visitors or occasional visitors and not relevant to the application site. However, the following S41 species identified by the records could potentially breed on the site: lapwing *Vanellus vanellus*, dunnock, house sparrow *Passer domesticus*, linnet, starling, song thrush, bullfinch *Pyrrhula pyrrhula* and yellowhammer.



3.5.3 Interpretation

The hedgerows on site provide suitable habitat for a range of breeding birds, although the majority of the habitat on site consists of sparsely vegetated land with scattered trees and hedgerows along the borders. The assemblage of breeding birds making use of the hedgerows on site were typical of these habitats and comprised predominantly common and widespread species. Five species are 'red' listed under the Birds of Conservation Concern (BoCC) (greenfinch, house sparrow, linnet, starling & yellowhammer). Two species 'red' listed under the Birds of Conservation Concern (BoCC) are also listed under Section 41 of the NERC Act (2006) (greenfinch and yellowhammer), and four species are 'amber' listed under the Birds of Conservation Concern (BoCC) (dunnock, rook, stock dove and wren). Based on these findings, the breeding bird assemblage supported by the site is considered to be important for the conservation of birds at the **local level**.

3.6 Overwintering Birds

3.6.1 Survey Results

In total, 20 species of bird were recorded during the survey; of these, 1 species is 'red' listed under the Birds of Conservation Concern (BoCC) and 2 are 'amber' listed. The following species recorded during the survey are also listed under Section 41 of the NERC Act (2006): herring gull *Larus argentatus*.

Table 14 presents the dates, times and survey conditions recorded for each visit.

Table 15 presents the bird survey results combined for all six visits. The table is divided into red, amber, and green lists from the BoCC categories.

Table 14. Weather conditions recorded during overwintering bird surveys.

Survey date	Survey time	Weather notes	Surveyor
20/11/20	09:50–11:30	6.5 degrees Celsius and 0–5mph wind, 10% cloud cover, light rain	Owen Crawshaw, BSc, MCIEEM
21/12/20	10:42–11:50	12 degrees Celsius and 5–15mph wind, 100% cloud cover, light rain	Owen Crawshaw, BSc, MCIEEM
21/01/21	09:00–10:35	7 degrees Celsius, 0% cloud cover and 5–10mph wind, sunny	Owen Crawshaw, BSc, MCIEEM
25/02/21	09:40–11:10	10 degrees Celsius, 100% cloud cover and 0–5mph wind, light rain	Owen Crawshaw, BSc, MCIEEM
30/11/22	09:52–11:20	9 degrees Celsius, 90% cloud cover and 0–5mph wind, no rain	Owen Crawshaw, BSc, MCIEEM
13/01/23	09:58–11:18	10 degrees Celsius, 0% cloud cover and 0–5mph wind, no rain	Owen Crawshaw, BSc, MCIEEM



Table 15. Overwintering bird survey summary list.

RESULTS Species	Nov 20	Dec 20	Jan 21	Feb 21	Nov 22	Jan 23
Herring gull <i>Larus argentatus</i>		1		5		1
Common redstart <i>Phoenicurus phoenicurus</i>					15	
Wren <i>Troglodytes troglodytes</i>					2	
Blackbird <i>Turdus merula</i>				1	3	2
Black-headed gull <i>Chroicocephalus ridibundus</i>			3			
Blue tit <i>Cyanistes caeruleus</i>	2		1			
Bullfinch <i>Pyrrhula pyrrhula</i>			1			
Carion crow <i>Corvus corone</i>		2			1	3
Chaffinch <i>Fringilla coelebs</i>			1	2		
Feral pigeon <i>Columba livia</i>			15			
Goldfinch <i>Carduelis carduelis</i>			3	5	1	10
Greater spotted woodpecker <i>Dendrocopos major</i>		1			2	
Great tit <i>Parus major</i>			1			
Green woodpecker <i>Picus viridis</i>				1		1
Jay <i>Garrulus glandarius</i>					3	1
Long-tailed tit <i>Aegithalos caudatus</i>	1					
Magpie <i>Pica pica</i>			1		3	1
Pied wagtail <i>Motacilla alba</i>			1			
Robin <i>Erithacus rubecula</i>				2	2	2
Wood pigeon <i>Columba palumbus</i>	6	4	31	68	8	

3.6.2 Pre-existing Records

SxBRC provided numerous bird records for the search area concerning a total of 176 species. Most of these species are relatively common and widespread, but the list includes 30 species of principal importance for conservation (S41 NERC Act 2007), and 37 species listed on Schedule 1 of the Wildlife and Countryside Act. In addition, 37 species are red listed on the Birds of Conservation Concern.

A high proportion of the records are non-breeding visitors or occasional visitors and not relevant to the application site. However, lapwing *Vanellus vanellus* (an S41 species identified by the records) could potentially overwinter on the site.

3.6.3 Interpretation

The hedgerows, scattered trees and sparsely vegetated land on site provide suitable habitat for a range of overwintering birds. The assemblage of birds making use of the habitats on site are typical of these habitats and comprised predominantly common and widespread species. Five species are 'red' listed under the Birds of Conservation Concern (BoCC) and also listed under Section 41 of the NERC Act



(2006), and two species are 'amber' listed under the Birds of Conservation Concern (BoCC). Based on these findings, the overwintering bird assemblage supported by the site is considered to be important for the conservation of birds at a **local level**.

3.7 Dormice

3.7.1 Nest-tube Survey

No dormice or nests were found during the surveys in 2021.

A dormouse nest was found in a nest- tube within a hedgerow in the north-eastern area of the site on two occasions during the surveys in 2024. No evidence of dormice was found anywhere else on site, however there is good connecting habitat and it should be assumed that there is potential for dormice to be present .

The 2024 survey findings, dates and conditions are presented in Table 16. The location of the tube containing the dormouse nest is shown in Figure 11.

Table 16 Dormouse survey results

Date	Start time	Weather conditions	Results
23/05/24	10:37	23°C 30%cc, wind 4, dry	No evidence of nests or dormouse.
24/06/24	08:30	21°C 50%cc, wind 3, dry	Dormouse nest found in hedgerow in tube 5.
17/07/24	09:30	19°C 50%cc, wind 2, dry	No evidence of nests or dormouse.
23/08/24	10:30	20°C 50%cc, wind 3, dry	Dormouse nest found in hedgerow in tube 5.
26/09/24	09:40	15°C 100%cc, wind 3, dry	No evidence of nests or dormouse.



Figure 11. Dormouse survey results. Red dot indicates location of dormouse nest. Images produced courtesy of Google maps (map data ©2024 Google).

3.7.2 Pre-existing Records

While no records of this species were provided by SxBRC, this species is known to be under-recorded and could occur in any suitable habitat.

3.7.3 Interpretation

The site contains hedgerow and scrub habitat, which is well connected throughout, and is further well connected to habitat of value within the surrounding landscape.

One dormouse nest was found during the surveys but, due to the extent of suitable habitat and the cryptic nature of this species, it must be assumed that a greater population may be present.

The current survey suggests that common dormouse may be restricted to the north-east area of the site and not across the wider site, despite suitable habitat and good ecological connectivity. However, this result should be interpreted with caution and it is common best practice to assume that they could occur in any suitable habitat around a positive record, as they may use the habitat in other years or choose not to nest in the dormouse tubes in optimal habitats.



Dormice are recognised as vulnerable in the UK, though they are fairly common in many parts of the Southeast of England. Based on the survey findings and the fairly restricted recorded distribution of this species within the Site, the habitats contained within the site boundary are considered likely important for the conservation of dormice at a local level.

3.8 Great Crested Newts

3.8.1 Habitat Suitability and eDNA Testing Results

In total, the desk study identified 8 waterbodies (ditches) within 500m of the proposed development boundary. Three were discounted at an early stage as either clearly unsuitable for great crested newts (they contained no water) or did not exist at all. Two were discounted from further survey work because they were separated from the development site by a major road and residential housing, which were considered significant barriers to dispersal. Three ditches were carried forward for eDNA testing. One ditch was located 400m south-east of the site (Ditch X), one located 350m south-east of the site (Ditch 8) and one 300m south-west of the site (Ditch 4). All returned negative eDNA results. Details of the HSI assessments are presented in Appendix 3.

Table 17 presents a summary of all surveys undertaken at waterbodies within 500m of the proposed development boundary. The location of each waterbody is presented in Figure 12. All waterbodies identified within 500m have been assessed in some way or another and have been accounted for, for the purposes of this EclA.

Table 17. Summary of great crested newt assessments and surveys.

Ref.	NGR	Distance/ direction	Description	HSI value	Interpretation	Survey results
Ditch X	SU 93793 03858	400m south-east of site	Ditch	0.53	Below average suitability	eDNA sampled on 29th April 2021 Results=negative. No further action taken. Waterbody dry in 2024.
Ditch 8	SU 93603 03755	350m south-east of site	Ditch	0.71	Good suitability	eDNA sampled on 29th April 2021 Results=negative. No further action taken. Waterbody dry in 2024.
Ditch 4	SU 93271 03854	300m south- west of site	Ditch	0.71	Good suitability	eDNA sampled on 29th April 2021 & 7th June 2024 Results=negative. No further action taken.

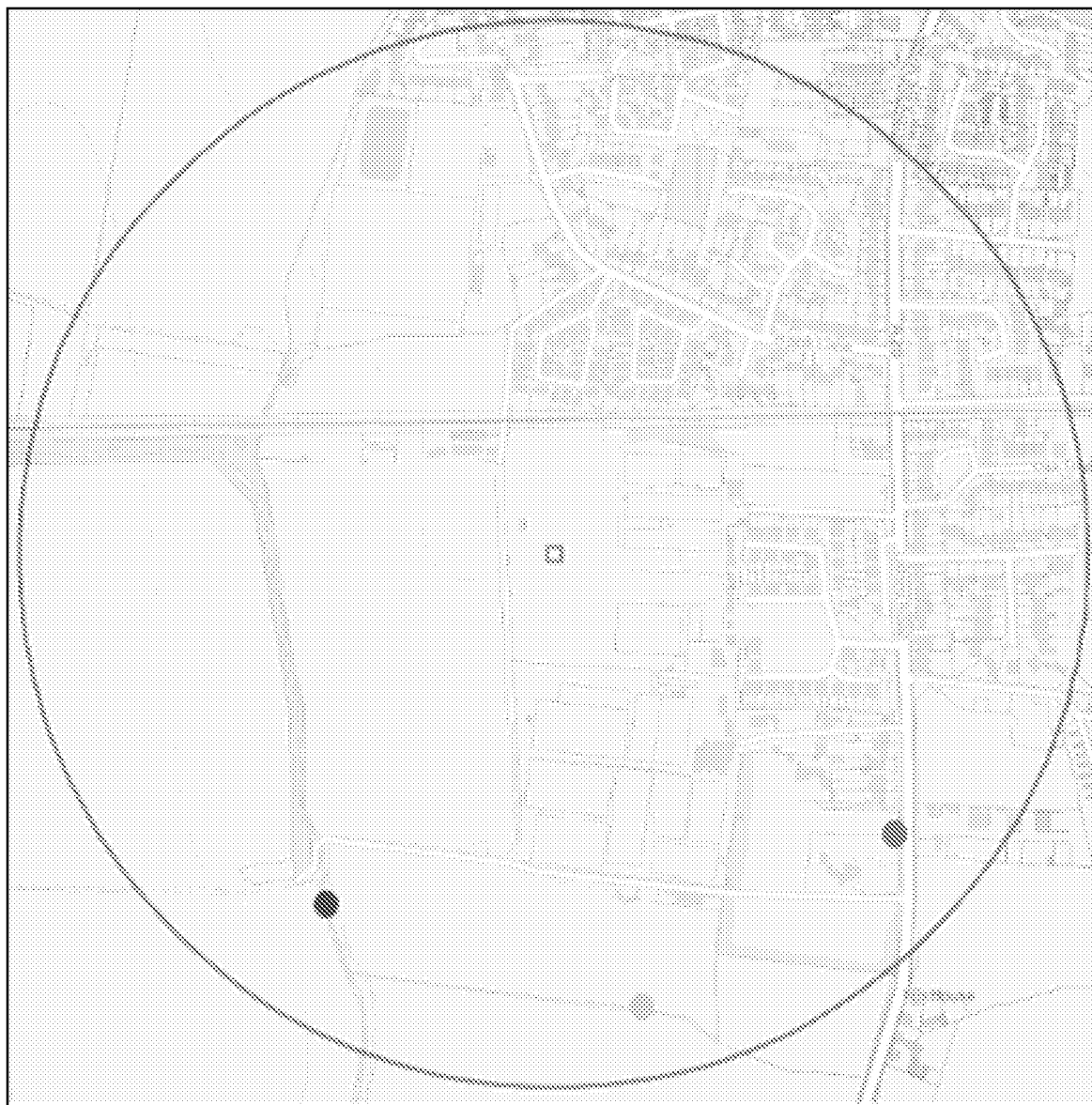


Figure 12. Ditches within 500m of the boundary to the site. Red dot = Ditch X, yellow dot = Ditch 8, and purple dot = Ditch 4. Images produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).

3.8.2 Pre-existing Records

SxBRC provided 27 amphibian records in the search area. This included 6 records for great crested newt, 8 records for smooth newt *Lissotriton vulgaris*, 1 record for palmate newt *Lissotriton helvetica*, 12 records for common frog *Rana temporaria* and 1 record for common toad *Bufo bufo*. The closest of these, located approximately 600m north of the site (beyond the railway), was in relation to great crested newts, which recorded one female and one male that were bottle trapped within a reservoir pond in 2013.

3.8.3 Interpretation

Based on the eDNA results, it is concluded that great crested newts are highly unlikely to be present on the site.



3.9 Reptiles

3.9.1 Survey Results

The survey findings, dates and conditions are presented in Table 18. Locations where reptiles were found are shown in Figures 13&14.

One species of reptile, slow-worm, was recorded at the site. A total of 44 adult slow-worms were recorded over seven surveys. These were found under fifteen refuges on field edges along the site boundaries.

Following the guidelines in *Advice Sheet 10 – Reptile Survey* (Froglife, 1999), it was determined that the site supports a good population of slow-worms and a low population of common lizard.

Table 18. Reptile survey results

Date	Start time	Air temp. °C	Weather conditions	Results
19/05/21	11:15	14°C	60%cc, wind 3, dry	1 adult slow-worm
25/05/21	09:05	13°C	70%cc, wind 3, dry	7 adult slow-worms
28/05/21	09:15	14°C	95%cc, wind 2, dry	10 adult slow-worms
01/06/21	07:45	15°C	0%cc, wind 1, dry	none found
7/06/21	09:05	14°C	100%cc, wind 0, dry	3 adult slow-worms
14/06/21	07:40	17°C	0%cc, wind 1, dry	4 adult slow-worm
14/07/21	08:35	17°C	0%cc, wind 2, dry	19 adult slow-worms
01/07/24	13:20	15°C	40%cc, wind 1, dry	5 adult slow-worms
11/07/24	08:45	17°C	20%cc, wind 1, dry	1 x common lizard, 8 adult slow worms
17/07/24	11:30	18.4°C	90%cc, wind 1, dry	1 juvenile common lizard, 8 adult slow worms, 2 juvenile slow worms
23/07/24	11:30	18°C	100%cc, wind 0, dry	2 adult common lizard, 2 juvenile common lizard, 16 slow worms
07/08/24	15:00	17°C	70%cc, wind 0, dry	1 common lizard, 2 slow worms
13/08/24	10:00	18°C	60%cc, wind 2, dry	1 adult slow-worm
19/08/24	10:30	15°C	0%cc, wind 1, dry	1 common lizard



Figure 13. Reptile survey results 2021. Red dots indicate where slow-worms were located. Images produced courtesy of Google maps (map data ©2024 Google).



Figure 14. Reptile survey results 2024. Red dots indicate where slow-worms were located. Yellow dots indicate where slow-worms & common lizards were located. Images produced courtesy of Google maps (map data ©2024 Google).

3.9.2 Pre-existing Records

SxBRC provided 47 reptile records in the search area. This includes 10 records for common lizard (the most recent dated 2019), 23 records for slow-worm (the most recent from 2019), 13 records for grass snake (the most recent from 2019) and 1 record for adder from 1999. The closest of these was for common lizard (peak of 4 individuals) and slow worm (peak of 23 individuals) at 780m north-east from the boundary of the site, dated 2016.

3.9.3 Interpretation

Slow-worms and common lizard are common and widespread species in south-east England and likely to be present in most areas of suitable habitat. Based on the small numbers involved, the small extent of habitat and absence of other reptile species, the populations contained within the development site is not considered important to common reptiles beyond the **site level**.



3.10 Riparian Wildlife

3.10.1 Survey Results

A network of ditches was identified within 500m of the site boundary, the majority of which were dry at the time of survey. One ditch (Ditch 8) contained water at the time of survey; however, this is relatively isolated within the site surrounded by sub-optimal arable habitat. Furthermore, the site lacks an abundance of aquatic plant species, which are favoured by foraging water voles. The site is unlikely to be used by commuting otters due to the current condition of the waterbodies and the lack of water further makes the presence of water vole unlikely.

3.10.2 Pre-existing Records

SxBRC provided 33 records for water vole, the most recent dated 2017 in the search area. The closest of these was 530m east of the boundary of the site for a swimming individual identified through a water vole survey, dated 2013. SxBRC did not return any records for otter or white-clawed crayfish.

3.10.3 Interpretation

There are no main rivers or watercourses on or within 2km of the site. In addition, the topography along the ditch is flat and relatively devoid of vegetation, therefore lacking areas considered suitable for water voles to dig burrows. As such, the site is considered to have **negligible potential** for otter and water vole and as such, these species are not considered further in this assessment.

3.11 Other Notable Species

3.11.1 Survey Results

There is potential for habitats, in particular along the hedgerows and field margins, contained in the development area, to support hedgehog *Erinaceus europaeus*.

3.11.2 Pre-existing Records

SxBRC provided 33 records of hedgehog in the search area, the most recent dated 2017. The closest hedgehog record is located immediately adjacent to the site's eastern boundary and is dated 2012.

3.11.3 Interpretation

The development of the site will result in the loss of potential habitat for hedgehogs (a species of principal importance for nature conservation (Section 41 NERC Act 2006)), though the features of greatest value (the boundary hedgerows) will be retained. This habitat loss will be temporary but could have a localised effect upon foraging habitat availability and would pose a mortality risk.

3.12 Invasive Non-native Species

3.12.1 Survey Results

No evidence of invasive non-native species was found during the walkover survey.



3.12.2 Pre-existing Records

SxBRC provided 94 records concerning a total of 20 invasive non-native plant species in the search area. This includes the following Schedule 9 species: water fern *Azolla filiculoides*, three-cornered garlic *Allium triquetrum*, wall cotoneaster, New Zealand pigmyweed *Crassula helmsii*, montbretia, Nuttall's waterweed *Elodea nuttallii*, Japanese knotweed, giant hogweed *Heracleum mantegazzianum*, Indian balsam *Impatiens glandulifera*, variegated yellow archangel *Lamium galeobdolon* subsp. *argenteum*, parrot's-feather *Myriophyllum aquaticum*, Virginia creeper *Parthenocissus quinquefolia*, false-acacia *Robinia pseudoacacia* and rhododendron species *Rhododendron ponticum*. None of these records are associated with the site, with the closest – three-cornered garlic – dated 2009, located approximately 1km south.

3.12.3 Interpretation

No evidence of invasive non-native species was found during the walkover survey.



4 IMPACT ASSESSMENT

In this section, the predicted impacts and effects of the proposed scheme are described for each important ecological feature in turn. This is based on the best available information, both on the baseline ecological condition and on the method of construction, timescale and other development/planning constraints known at the time. The significance of the impact on nature conservation is recorded in accordance with CIEEM guidance and the degree of uncertainty relating to the occurrence and severity of an impact is discussed.

This assessment is based on the most up to date available plan shown on the Draft Block Plan accompanying this application.

The proposed indicative scheme comprises a residential development to include up to 140 dwellings with associated parking, hard and soft landscaping, private garden space and areas of public open space. Existing access off Lidsey Road to the east will be used.

Activities that will occur during the proposed construction and operational phases that could give rise to significant ecological effects include:

Construction:

- direct harm from pollution, noise, lighting, vibration and the movement of people and construction machinery
- soil compaction
- habitat severance caused by construction works on-site.
- habitat destruction during site clearance activities.

Post construction/operation:

- permanent habitat loss
- chronic disturbance from noise, lighting, vibration and the movement of people, vehicles on-site; risk of traffic collisions
- increased recreational use of adjacent habitats leading to soil compaction, human/dog disturbance, littering, physical damage to trees.
- increase in numbers of people and pets on site.

4.1 Designated Sites

4.1.1 Impact Characterisation

Land adjacent to Woodgate Nurseries lies 1.6km from The Brooks LNR, ensuring that there are no likely mechanisms for impact upon this site resulting from noise, dust, localised pollution effects. There is a very limited risk of adverse effects associated with increased visitor numbers to The Brooks LNR, which is managed by Arun District Council. The site is well managed, with footpaths, dog bins and information boards provided.



4.1.2 Significance of Effects

Based on the above, the proposed project is considered likely to have a **negligible** effect on the Brooks LNR. Given the active management that the site is under through Arun District Council and the very relatively small potential increase in public use, visitor impacts are not considered likely to lead to significant adverse effects upon this LNR.

4.2 Badgers

Please refer to Appendix 6.

4.3 Bats

4.3.1 Impact Characterisation

It is understood that the proposed scheme will not affect any trees or buildings that have potential roosting features suitable for bats. Therefore, no adverse effects on bat roosts in trees are predicted.

The proposed development has potential to result in disturbance to commuting and foraging bats, both during construction and in the long term after completion, particularly through increased artificial lighting, which can disrupt commuting corridors. Loss of habitat of significant importance to bats is likely to be minimal as the majority of tree and hedgerow habitats are retained within the site.

4.3.2 Significance of Effects

Since the activity surveys did not reveal use of the site by large numbers of foraging bats and few records of western barbastelle, the effects before mitigation are considered to be likely negative and significant at a local level.

4.4 Breeding Birds

4.4.1 Impact Characterisation

The proposed development has potential to result in disturbance to breeding birds, both during construction and in the long term after completion, through loss of habitat, dust and noise impacts during construction, predation by domestic cats and disturbance of habitats by new residents. Loss of habitat of significant importance to breeding birds is likely to be minimal as the majority of tree and hedgerow habitats are retained within the site.

4.4.2 Significance of Effects

Whilst it is considered that the site has low significance for breeding birds, the site does support a small number of species that are amber and red BoCC listed. Effects before mitigation are considered to be certain and negative at a local level only, given the context of the site with abundant similar habitat available in the local landscape.



4.5 Overwintering Birds

4.5.1 Impact Characterisation

The proposed development has potential to result in disturbance to overwintering birds, both during construction and in the long term after completion, through loss of habitat. Loss of habitat of significant importance to overwintering birds is likely to be minimal as the majority of tree and hedgerow habitats are retained within the site. Loss of sparsely vegetated land will result in the loss of foraging habitat and cover for overwintering birds.

4.5.2 Significance of Effects

Whilst the site has low significance for its assemblage of overwintering birds, it does support a small number of species that are amber and red BoCC listed. Effects before mitigation are considered certain and negative at a local level only, considering the abundance of similar habitat available within the local landscape.

4.6 Common Dormice

4.6.1 Impact Characterisation

The majority of suitable dormouse habitat will be retained at the site. However, the loss of some small areas of hedgerow and bramble scrub could result in direct harm to individual dormice and a negative effect on the conservation status of this species. The current distribution of the population present is poor, with presence only identified in the north-east of the site, though this species can be difficult to detect and the potential for the development to reduce opportunities for future colonisation of the site where suitable habitat is present must also be considered.

The proposed development includes removal of the hedgerow where the nest tube with the nest was found. Additionally, all the scrub on site, and some hedgerow areas within the site are to be removed, though the hedgerow habitat and trees around the boundary of the site are to be retained. This will result in a temporary loss of suitable nesting and foraging habitat across the site, as well as possibly cause direct harm to dormice during construction activities.

The proposed development will likely result in a significant increase in cats on site which will result in a significant increase in predation risk to dormice¹¹.

There is likely to be a temporary impact from noise and vibration during the construction phase and a long-term impact from light pollution during the operational phase.

4.6.2 Significance of Effects

In the absence of mitigation, the impacts will have a **certain adverse** effect on dormice considered to be significant at the **local level**.

¹¹ Woods et al (2003) Predation of wildlife by domestic cats *Felis catus* in Great Britain



4.7 *Great Crested Newts*

4.7.1 Impact Characterisation

Based on the survey results, great crested newts are considered to be likely absent from the site.

4.7.2 Significance of Effects

As great crested newts have not been identified on the site, it can be concluded that no significant effects are likely to occur.

4.8 *Reptiles*

4.8.1 Impact Characterisation

With regards to reptiles, in the absence of mitigation, the proposed development has potential to result in loss of habitat, killing, injury and disturbance during the construction and operational phase. Mitigation will need to be implemented at the site to meet the requirements of the NPPF and prevent a breach of the Wildlife & Countryside Act 1981 (as amended).

4.8.2 Significance of Effects

Since the surveys did not reveal use of the site by large numbers of reptiles or the presence of rare species, these effects before mitigation are considered to be certain and negative at a local level.

4.9 *Riparian Wildlife*

4.9.1 Impact Characterisation

Based on the survey results, otter and water vole are considered to be absent from the site.

4.9.2 Significance of Effects

As riparian wildlife has not been identified on the site, it can be concluded that no significant effects are likely to occur.

4.10 *Other Notable Species*

4.10.1 Impact Characterisation

Based on the low biodiversity value of most of the existing habitats that will be lost to the proposed development, in general it can be concluded that important populations of other notable species are unlikely to be present and impacts are likely to be minimal.

However, based on pre-existing records the scheme has potential to impact on European hedgehog through habitat loss, though this is restricted to the field boundaries. Most of the existing habitat is sub-optimal for this species due to a lack of ground cover for resting hedgehogs, though the field boundaries could potentially be used for foraging and commuting between more valuable foraging resources. Residential development and the associated mosaic of private gardens will replace this habitat and green space created would, in time, become suitable for hedgehogs replacing habitat lost and indeed



leading to an increase in suitable available habitat. In the absence of mitigation, there remains a risk of direct harm to hedgehogs during construction activities, if present on the development site. In the long term, the proposed development could result in some fragmentation of hedgehog foraging and resting areas as fencing between properties could restrict the movement of hedgehogs.

4.10.2 Significance of Effects

The hedgehog has suffered dramatic declines in population in recent decades, although it remains fairly widespread and has declined less in urban areas than rural areas (Warwick, H., 2016¹²). There is a high degree of uncertainty of impacts occurring but based on the relatively low habitat quality contained on the site for hedgehogs, the proposed scheme is unlikely to result in effects that are significant beyond **local level**, should this species be present.

4.11 Invasive Non-native Species

4.11.1 Impact Characterisation

No invasive non-native species were recorded on site.

4.11.2 Significance of Effects

As Invasive non-native species have not been identified on the site, it can be concluded that no significant effects are likely to occur.

5 MITIGATION PROPOSALS

5.1 Badgers

Please refer to Appendix 6

5.2 Bats

5.2.1 Impact Avoidance

The habitats of greatest value for bats are retained within the site layout, with existing site boundaries retained. Only essential lighting will be incorporated into the site design, and this will be positioned away from green spaces and boundaries.

5.2.2 Mitigation Measures

It is important that the proposed scheme incorporates a 'sensitive lighting plan' developed as part of the detailed design, in accordance with guidelines set out by the Bat Conservation Trust (summarised in Appendix 4). This should include measures to minimise light spill onto all semi-natural habitats. All street lighting should be directed downwards and use light sources that are not attractive to insects.

¹² Warwick, H. (2016) Britain's Hedgehogs: research and the conservation effort in the face of serious decline. British wildlife Vol. 28, pp78-86



Reflective white line marking should be used in preference to artificial lighting in all non-essential applications. The scheme must aim to ensure that all site boundaries do not receive more than 2 lux of light from artificial light sources. Loss of habitat can be compensated for through the planting of native tree and hedgerow species within the site as detailed within the landscape plan produced for the development.

5.2.3 Residual Effects

With impact avoidance measures and mitigation measures, the likely effects are considered to be not significant. No residual effects have been identified.

5.3 Breeding Birds

5.3.1 Impact Avoidance

The habitats of greatest value for breeding birds are retained within the site layout, with existing site boundaries retained. As far as possible, construction work within or adjacent to suitable bird nesting habitat will be undertaken outside the breeding bird period (avoiding March to August inclusive). Where this is not possible mitigation measures will be put in place.

5.3.2 Mitigation Measures

No habitats suitable for nesting birds will be removed during the nesting bird season (1st March to 31st August) and heras fencing will be used to protect all retained nesting bird habitat from direct disturbance, with fencing creating a minimum three metre buffer between hedgerows and construction areas. Loss of habitat can be compensated for through the planting of native tree and hedgerow species within the site as detailed within the landscape plan produced for the development. The effect of predation by domestic cats can be reduced by incorporating thorny planting into the site boundaries, which makes hedgerows more difficult to access for them.

5.3.3 Residual Effects

With impact avoidance measures and mitigation measures, the likely effects are considered to be not significant. No significant residual effects have been identified.

5.4 Overwintering Birds

5.4.1 Impact Avoidance

The habitats of greatest value for overwintering birds are retained within the site layout, with existing site boundaries retained. Areas required for construction works, storage of materials or access would be minimised as much as is practicable to reduce the impact of disturbance on overwintering birds. Sparsely vegetated land lost within the development will be replaced with grassland with a higher value for foraging and cover for overwintering birds.

5.4.2 Mitigation Measures

Fencing will be used to protect all retained nesting bird habitat from direct disturbance, with fencing creating a minimum three metre buffer between hedgerows and construction areas. Loss of habitat can



be compensated for through the planting of native tree and hedgerow species within the site as detailed within the landscape plan produced for the development.

5.4.3 Residual Effects

With impact avoidance measures and mitigation measures, the likely effects are considered to be not significant. No residual effects have been identified.

5.5 Dormice

5.5.1 Impact Avoidance

The hedgerow and trees along the site boundary are to be retained. The removal of large areas of scrub and a small section of hedgerow within the site cannot be avoided.

5.5.2 Mitigation Measures

Based on the survey results, it is reasonable to assume that dormice may be present in all areas of hedgerow and scrub within the site. Since the proposed development involves removal of this habitat, a European Protected Species (EPS) licence must be obtained from Natural England for the development to legally proceed. Details of the mitigation measures will be set out in a method statement submitted with the licence application at an appropriate time before construction and habitat restoration works commence.

5.5.3 Residual Effects

With mitigation in place and replacement of habitat loss, the residual effect of the proposed development on dormice is reduced to **local level** only.

5.5.4 Compensation Measures

The 'poor' condition hedgerow that is being lost within the site will be replaced with 'moderate' condition species-rich native hedgerow. The development includes new planting of hedgerow and scrub within the site. This will reinforce connectivity of the site to suitable habitat in the wider landscape as well as provide new nesting and foraging habitat once established. The Biodiversity Impact Calculation report sets out habitat gains and losses, which result in both habitat area and linear habitat area gains in biodiversity value. Suitable dormouse habitat that will be created within this strategy includes 0.726 hectares of mixed scrub and 676m of new native hedgerows that will lead to overall gains in habitat biodiversity value.

With these compensation measures in place, the effect of the proposed development on dormice is reduced to **likely negligible**.

5.6 Reptiles

5.6.1 Impact Avoidance

Protection measures to prevent slow-worms & common lizards being killed and/or injured during works



will include the clearance of areas of suitable habitat for the species under reasonable avoidance measures and sustained habitat management. It is important that leading up to the commencement of construction the field margins are managed so that they do not become suitable for reptiles, which would increase mortality risk. The boundary habitats will be retained to reduce the potential impacts upon this species.

5.6.2 Mitigation Measures

Reptiles will be displaced to a greenspace buffer area fenced off from the rest of the site prior to construction works commencing, with this work detailed and carried out according to a Detailed Method Statement. The establishment of this receptor area prior to the commencement of construction will be essential to ensure that the habitat supporting them has matured. A Landscape and Ecology Management Plan will detail where the receptor area will be located and established prior to construction works commencing.

5.6.3 Residual Effects

With impact avoidance measures and mitigation measures, the likely effects are considered to be not significant. No residual effects have been identified.

5.7 Other Notable Species

5.7.1 Impact Avoidance

The boundary habitats will be retained to reduce potential impacts upon hedgehogs.

5.7.2 Mitigation Measures

Heras fencing that restricts construction activity within three metres of boundary habitats will ensure that risks of mortality are minimised. Enhancements through the creation of new habitats of value for hedgehog and provision of access points through garden boundaries will ensure that this species can move freely through the site to access foraging resources. It is recommended that the landscape design for the proposed development should incorporate some compensatory habitats for foraging and resting hedgehogs and allow the unrestricted movement of hedgehogs through residential gardens by leaving gaps at the bottom of garden fences.

5.7.3 Residual Effects

With impact avoidance measures and mitigation measures, the likely effects are considered to be not significant. No residual effects have been identified.

6 BIODIVERSITY ENHANCEMENTS

The habitats present within the development area are predominantly of low ecological value, significant at a site level only. The habitats with some intrinsic value for nature conservation which are likely to be affected by the proposals are the hedgerows within the development area which should be subject to mitigation and/or compensation measures, but broadly will be retained through the development process. The majority of habitats of significant ecological importance present within the development



area and the wider survey area will be retained as part of the proposals with scope for enhancement through widening and supplementary planting. The production of a Landscape and Ecology Management Plan (LEMP) will be necessary to demonstrate how the proposals can provide a net benefit for biodiversity and can include targeted enhancement for particular species or species groups of conservation interest. This will satisfy the objectives of the NPPF and would be considered favourably by the planning authority.

Specific enhancements that must be included within the LEMP are as follows:

- sowing of SuDS features with species-rich wetland wildflower mixtures such as Mixture EM8 by Emorsgate seeds. This mixture must include no less than 20 native grass and wildflower species sown in the early spring or early autumn. Once established it must not be cut more than twice per year and its management must follow the prescriptions set out within the LEMP.
- neutral wildflower meadow grassland will be established in new greenspace areas, particularly the areas identified as 'Natural and Semi-natural open space' in Figure 2. The most appropriate seed mixture for this area would be EM3 by Emorsgate seeds, containing 29 native grass and wildflower species.
- new native hedgerow planting will be used to create new boundaries with access roads and other features. These hedgerows will be planted at a density of five hedge trees per linear metre and will comprise of 50% hawthorn *Crataegus monogyna*, with not less than five additional native tree species forming the remainder of the planting mix, including species such as blackthorn *Prunus spinosa*, dogwood *Cornus sanguinea*, field maple *Acer campestre*, hazel *Corylus avellana*, purging buckthorn *Rhamnus cathartica*, wild privet *Ligustrum vulgare* and guelder rose *Viburnum opulus*.
- the provision of no less than 35 new features for roosting bats, including ten cavity wall boxes such as the habitat bat box or vivara pro build-in WoodStone bat box, ten crevice roosting features for buildings, such as the Schwegler 2FE wall mounted shelter or Beaumaris woodstone bat box and fifteen tree mounted bat boxes, such as the general purpose bat box.
- the provision of 45 new features for nesting birds, including 10 swift boxes, 10 house martin cups, 10 house sparrow terraces and 15 general purpose bird boxes.

7 CONCLUSIONS

A summary of the EclA process is presented in Table19 below.

Table 19 Summary Table

Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual impact	Compensation required? (Y/N)
Habitats contained within site	Local	Direct loss of large area of arable habitats	Local	None required	Site	N
Foraging and commuting bats	Local	Temporary loss of foraging habitat and change of habitat characteristics	Local	Ecologically sensitive lighting design	Site	N



Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual impact	Compensation required? (Y/N)
Breeding bird assemblage on development site	Local	Direct loss of breeding habitat of low importance;	Local	Appropriate Construction methods (vegetation removal timed outside breeding season)	Site	Y
Dormouse	Local	Direct loss of suitable habitat and habitat fragmentation. Disturbance through artificial lighting and increased recreation pressure. Increased risk of predation by cats.	Local	Mitigation for direct impacts covered by EPS licence. Biodiversity enhancements incorporated into soft landscape scheme. Ecologically sensitive lighting design.	Site	Y
Common reptiles	Site	Existing population is small, and quality of existing habitat is poor.	Site	Precautionary approach to construction methods; 'reasonable avoidance measures';	Potential local positive impact	N
Other notable species: European hedgehog	Uncertain; local	Temporary loss of foraging habitat and change of habitat characteristics	Uncertain; local	Protection of site boundaries with appropriate fencing	Potential local positive impact	N



APPENDIX 1 – LEGISLATION AND POLICY

Introduction

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to wildlife in general and certain species. It includes current national planning policy relevant to nature conservation.

The ‘Birds Directive’, ‘Habitats Directive’ and ‘Natura 2000 Sites’.

The Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”) sets a framework for the protection of wild birds. Under the directive, several provisions are made including the designation and protection of ‘Special Protection Areas’ (SPAs) – areas which support important bird populations, and the legal protection of rare or vulnerable species.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) directs member states of the EU to take measures to maintain favourable conservation status of important habitats and species. This requires the designation of a series of sites which contain important populations of species listed on Annex II of the directive. Together with ‘Special Areas of Conservation’ (SPAs), designated under the Birds Directive, SACs form a network across Europe of protected areas known as the ‘Natura 2000’.

Annex IV lists species in need of more strict protection, these are known as “European Protected Species (EPS)”. All bat species, common dormice *Muscardinus avellana*, otter *Lutra lutra* and great crested newts *Triturus cristatus* are examples of EPS that are regularly encountered during development projects.

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites receive the highest level of protection under this regulation which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects on the integrity of the site are identified.

For European Protected Species, Regulation 41 makes it a criminal offence to;

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb wild animals of such species;
- Deliberately take or destroy their eggs (where relevant);
- Damage or destroy a *breeding or resting place* of such an animal;
- Possess, control, sell or exchange any live or dead animal or plant, of such species;
- Deliberately pick, collect, cut, uproot or destroy a wild plant of such species.

The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. Natural England is the licensing Authority



and, in order to grant a license, ensures that three statutory conditions (sometimes referred to as the 'three derogation tests') are met:

- A licence can be granted for the purposes of "preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment" (Regulation 53 (2) (e)).
- A licence can be granted if "there are no satisfactory alternatives" to the proposed action.
- A licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Wildlife and Countryside Act (1981) as amended.

The Wildlife and Countryside Act (1981)¹³ remains one of the most important pieces of wildlife legislation in the UK. There are various schedules to the Act protecting birds (Schedule 1), other animals including insects (Schedule 5), plants (Schedule 8), and control of invasive non-native species (Schedule 9).

Under the Wildlife and Countryside Act (WCA) 1981, all wild birds (with the exception of those listed on Schedule 2), their eggs and nests are protected by law and it is an offence to:

- Take, damage or destroy the nest of any wild bird while it is in use or being built.
- Take or destroy the egg of any wild bird.
- Disturb any bird listed on Schedule 1, while it is nest building, or at a nest with eggs or young, or disturb the dependant young of any such bird.

Schedule 5 lists all non-avian animals receiving protection to a varied degree. At its strongest, the Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturb animals while occupying such places. Examples of species with *full protection* include all EPS, common reptile species, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes* and Roman snail *Helix pomatia*. Other species are protected from sale, barter or exchange only, such as white letter hairstreak *Satyrion w-album*.

The Act makes it an offence to intentionally pick, uproot or destroy any plant or seed, and sell or possess any plant listed on Schedule 8. It is also an offence to intentionally uproot any wild plant not listed on Schedule 8 unless authorised [by the landowner]. Species on Schedules 5 and 8 are reviewed every 5 years when species can be added or removed.

Measures for the prevention of spreading non-native species which may be detrimental to native wildlife is included in the Act, which prohibits the release of animals or planting of plants into the wild of species listed on Schedule 9 (for example Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandifera*, New Zealand Pygmyweed *Crassula helmsii*).

The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap, poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, badger, otter, polecat, dormice, hedgehog and red squirrel).

¹³ Wildlife and Countryside Act (WCA) (1981). HMSO London.



Natural Environment and Rural Communities (NERC) Act (2006)

The NERC Act (2006)¹⁴ places a statutory duty under Section 40 on all public bodies, including planning authorities, to take, or promote the taking by others, steps to further the conservation of *habitats and species of principal importance for the conservation of biodiversity* in England (commonly referred to as the 'Biodiversity Duty'). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers. Section 41 lists the habitats and species of principle importance. This includes a wide range of species from mosses, vascular plants, invertebrates through to mammals and birds. It originates from the priority species listed under the UK Biodiversity Action Plan (UK BAP) with some omissions and additions.

Environment Act (2021)

The Environment Act sets a target of halting the decline in species through the inclusion of a legally binding 2030 species abundance target. Aiming to restore natural habitats and enhance biodiversity, the Act requires new developments to improve or create habitats for nature (through mechanisms such as mandatory Biodiversity Net Gain), and tackle deforestation. Going forwards, UK businesses will need to look closely at their supply chains as amongst other measures they will be prohibited from using commodities associated with wide-scale deforestation. Woodland protection measures are also strengthened through the Act.

The Act enables the reform of the Habitats Regulations and further improves protection for nature through the establishment of Local Nature Recovery Strategies that support national Nature Recovery Networks. In addition, the Act provides for the production of Protected Site Strategies and Species Conservation Strategies, aimed at supporting the design and delivery of strategic approaches to deliver better outcomes for nature.

Protection of Badgers Act (1992)

The Badger *Meles meles* is afforded specific legal protection in Britain under the Protection of Badgers Act (1992)¹⁵, and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (see above).

Under this legislation, it is a criminal offence to:

- intentionally kill, injure, take, possess, or cruelly ill-treat, a Badger, or to attempt to do so;
- interfere with a sett, by damaging or destroying it;
- to obstruct access to, or any entrance of, a Badger sett; or
- to disturb a Badger when it is occupying a sett.

A licence may be obtained from Natural England to permit certain prohibited actions for a number of defined reasons including interference of a sett for the purpose of development, provided that a certain number of conditions are met. Note that licenses are not normally granted for works affecting badgers between the end of November and the start of July.

National Planning Policy Framework

¹⁴ Natural Environment and Rural Communities Act (2006). HMSO London.

¹⁵ Protection of Badgers Act (1992). HMSO London.



The National Planning Policy Framework (NPPF 2021)¹⁶ sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

Paragraph 179b, which states that council policies should “*promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.*” The Office of the Deputy Prime Minister (ODPM) Circular 06/2005, 2005)¹⁷. In accordance with the NPPF, it is important that developments should contribute to and enhance the natural and local environment by:

- minimising impacts on existing biodiversity and habitats;
- providing net gains in biodiversity and habitats, wherever possible;
- establishing coherent ecological networks that are more resilient to current and future pressures.

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992). The UK BAP was replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.

The most recent biodiversity strategy for England, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra (2011)¹⁸, and a progress update was provided in July 2013 (Defra 2013)¹⁹.

'Biodiversity 2020' builds on the Natural Environment White Paper for England – 'The Natural Choice', published on 7 June 2011, and sets out the strategic direction for biodiversity policy for the next decade.

Biodiversity 2020 deliberately avoids setting specific targets and actions for local areas because Government believes that local people and organisations are best placed to decide how to implement the strategy in the most appropriate way for their area or situation.

Birds of Conservation Concern (BoCC)

¹⁶ HM Government (2021). National Planning Policy Framework. Department for Communities and Local Government. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

¹⁷ HM Government (2005) ODPM Circular 06/05 Government Circular: *Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf.

¹⁸ Defra (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>.

¹⁹ Defra (2013) Progress Update. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-simple-guide-and-progress-update-july-2013>.



In 1996, the UK's leading non-governmental bird conservation organisations reviewed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists (in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every 5 years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2015²⁰ (Eaton et al, 2015), which provides an up to date assessment of the conservation status of birds in the UK.

²⁰ Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D., and Gregory, R. (2015) Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108. December 2015. 708–746



APPENDIX 2 – LOCAL PLANNING POLICY

Arun District Council – Adoption Arun Local Plan 2011–2031

Policy number/title	Policy summary
Policy C SP1 Countryside	Outside the Built-Up Area Boundaries (as identified on the Policies Maps) land will be defined as countryside and will be recognised for its intrinsic character and beauty. Development will be permitted in the countryside where it is: a. for the operational needs of agriculture, horticulture, forestry, the extraction of minerals or the management of waste as part of a waste site allocation within the West Sussex Waste Local Plan; or b. for quiet, informal recreation; or c. for green infrastructure; or d. for the diversification of the rural economy; or e. for road and/or cycle schemes; or f. in accordance with other policies in the Plan which refer to a specific use or type of development. 7 Settlement Structure & Green Infrastructure The Council will take into account cumulative impact of development in the consideration of planning applications. To ensure better management of the rural-urban fringe in those areas where significant new development is proposed, early consideration will need to be given to landscape and biodiversity enhancement, woodland management, recreation provision and access routes.
ENV SP1 (Natural Environment)	Arun District Council will encourage and promote the preservation, restoration and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 17.1-17.7 that are recognised for the species and habitats contained within them.
ENV DM1 (Designated Sites of biodiversity or geological importance)	a. Proposed development likely to have an adverse effect on land with the designated features of any Site of Biodiversity or Geological Importance as listed in Tables 17.1 - 17.7 or any subsequently designated sites (either individually or in combination with other developments), will not normally be permitted. Consideration will be given to the exact designated features present on the site, their scarcity/rarity and recognition of the protection offered by their existing status. Development on wildlife sites with the highest value will only be permitted exceptionally where the following can be demonstrated: i. There is no alternative solution (which shall be adequately demonstrated by the developer). ii. There are reasons of public health or public safety or iii. There are benefits of primary importance to the environment or iv. There are imperative reasons of overriding public interest. Notwithstanding the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined. b. In determining any planning application affecting Sites of Biodiversity or Geological Importance the Council will ensure that the intrinsic natural features of particular interest



Policy number/title	Policy summary
	are safeguarded or enhanced having regard to; i. The European, National or Local status and designation of the site; ii. The nature and quality of the site's features, including its rarity value; iii. The extent of any adverse impacts on the notified features of interest; iv. The need for compensatory measures in order to re-create remaining features of habitats on or off the site. c. Where appropriate the Council will ensure the effective management of designated sites through the imposition of planning conditions or Section 106 agreements as appropriate.
Policy ENV DM3 Biodiversity Opportunity Areas	Development shall: a. Retain and sympathetically incorporate locally valued and important habitats, including wildlife corridors and stepping stones b. Be designed in order to minimise disturbance to habitats Development proposals that do not reasonably address opportunities for enhancing these through their design, layout and landscaping or access/management shall not be permitted. Where a development scheme would result in a habitat loss, mitigation measures will be proposed as part of the proposed scheme and such measures agreed with the Local Planning Authority prior to the determination of any planning application. Within Biodiversity Opportunity Areas (BOAs) identified on the Policies Maps or where likely to have an impact on species or habitats within the BOAs, any application for planning permission shall include a properly conducted survey of the presence must be proposed within the planning permission.
ENV DM4 (Protection of trees)	Development will be permitted where it can be demonstrated that trees protected by a Tree Preservation Order(s), (TPO) identified as Ancient Woodland, in a Conservation Area or contributing to local amenity, will not be damaged or destroyed now and as they reach maturity, unless development: a. Would result in the removal of one or more trees in the interests of good arboricultural practice. This shall be demonstrated by the developer following the advice of a suitably qualified person which shall be guided by BS 5837 (2012). Details of any advice received having regard to BS 5837 (2012) shall be submitted, in writing, as part of a planning application; or b. Would enhance the survival and growth prospects of other protected trees; c. The benefits of the proposed development in a particular location outweigh the loss of trees or woodland, especially ancient woodland. Where planning permission is granted in any of the above instances, conditions shall be used to ensure that, for any trees which are removed as part of a development, at least an equivalent number of a similar species and age (where practical) are planted on the proposed development site. Sufficient space for replacement trees to mature without causing future nuisance or damage shall be provided. The planting of new trees shall form an integral part of the design of any development scheme. Proper provision must be made for the protection and management of trees or areas of woodland on-site when undertaking development. A management plan shall be provided as part of a planning application in accordance with BS 5837 (2012) in order to ensure that trees are adequately protected during development and appropriately maintained in the future. Conditions for the continued protection of trees on sites shall be included in any planning permission given. Where there are existing trees on or adjacent to a development site, developers shall be required to provide: d. Land and tree surveys



Policy number/title	Policy summary
	e. A tree constraints plan f. An arboricultural impact assessment to include a tree protection plan and arboricultural method statement These will ensure that development is planned to take a comprehensive view of tree issues at an early stage in the design process and that development works do not have a negative impact on existing trees.
ENV DM5 (Development and biodiversity)	Development schemes shall, in the first instance, seek to achieve a net gain in biodiversity and protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement. Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person. All developments shall have regard to Natural England's standing advice for protected species.
W SP1 (Water)	Arun District Council will encourage water efficiency measures in order to protect the District's water resources and enhance the quality of the water environment which supports a range of habitats and ecosystems. Development will be encouraged to make active use of surface water as a design feature and permitted where it identifies measures to improve and enhance waterbodies, coastal habitats or provides additional flood relief. The Council will also support development that: a. is appropriately located, taking account of flood risk and promotes the incorporation of appropriate mitigation measures into new development, particularly Sustainable Drainage Systems that reduces the creation and flow of surface water and improves water quality; 63 Water stressed areas - final classification (July 2013) b. reduces the risk to homes and places of work from flooding whilst increasing biodiversity; c. delivers a range of community benefits including enhancing the quality of life and providing greater resistance to the impact of climate change.



APPENDIX 3 – IMPORTANCE OF ECOLOGICAL FEATURES

Table 1: Determining importance of an ecological feature

Level of importance	Criteria
International	Internationally designated site; Special Protected Area (SPA), Special Areas of Conservation (SAC), Ramsar, Biosphere Reserves; Regularly occurring population of internationally important species listed in Annex 1, 2 or 4 of the Habitats Directive and Annex 1 of the Birds Directive; A viable area of a habitat listed in Annex 1 of the Habitats Directive or area important for maintaining viability listed as in Annex 1 of the Habitats Directive; Areas outside designated sites that are important for supporting and maintaining the viability of the above designated habitats and/or species.
National	Nationally designated sites; Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Local Nature Reserves (LNR). A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the national conservation status (e.g. greater than 1% of the national total). A viable or regularly occurring population of a species that is nationally scarce, threatened or declining on a national scale. A habitat type that is nationally scarce, threatened or declining on a national scale.
Regional	A habitat type that is scarce, threatened or declining on a regional scale. A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the regional conservation status (e.g. greater than 1% of the national total).
County	Locally designated sites; Local Wildlife Sites (LWSs), Sites of Nature Conservation (SNCIs) and Site of Importance for Nature conservation (SINCs). A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the conservation status of the species at county level (e.g. greater than 10% of the county total). A viable or regularly occurring population of a species that is rare in the county, but may be common and widespread elsewhere, For example, a population at the edge of a species' range. A habitat type that is scarce in a county but may be more frequent elsewhere.
Local/parish	Habitats and species which are scarce in the local area but are sufficiently common and widespread elsewhere that they do not meet the above criteria.
Site / negligible	Habitats with little to no ecological value (e.g. amenity grassland and hardstanding)



APPENDIX 4 GREAT CRESTED NEWT SURVEY RESULTS

Table 1. HSI calculation for ponds assessed during the survey.

	Ditch X		Ditch 8		Ditch 4	
NGR	SU 93793 03858		SU 93603 03755		SU 93271 03854	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes
Location	1.00	A	1	A	1.00	A
Pond area	0.05	50m ²	0.15	75m ²	0.20	100m ²
Pond drying	0.50	sometimes	0.50	sometimes	0.50	sometimes
Water quality	0.33	poor	0.67	moderate	0.67	moderate
Shade cover	1.00	25%	1.00	50%	1.00	50%
Water-fowl	1.00	absent	1.00	absent	1.00	absent
Fish presence	1.00	absent	1.00	absent	1.00	absent
No. ponds	1.00	7	1.00	7	1.00	7
Terrestrial habitat	0.33	poor	0.67	moderate	0.67	moderate
Macrophytes	0.60	30%	1.00	80%	0.70	40%
H.S.I. value	0.53	'below average'	0.71	'good'	0.71	'good'



APPENDIX 5 ARTIFICIAL LIGHTING AND WILDLIFE

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts on other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness. Guidelines issued by the Bat Conservation Trust²¹ should be considered while designing the lighting scheme. A simple process which should be followed where the impact on bats is being considered as part of a proposed lighting scheme. It contains techniques which can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting on key habitats and features altogether.

there is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation. However, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species.

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations.

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results;

- Dark buffers, illuminance limits and zonation
- Sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill.
- Consider the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consider the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cats' eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times.
- Screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding.
- Glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and features.

²¹ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



- Creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development.
- Dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers.

- *Design and pre-planning phase*; It may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.